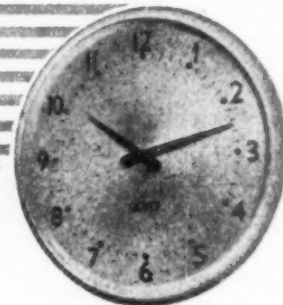
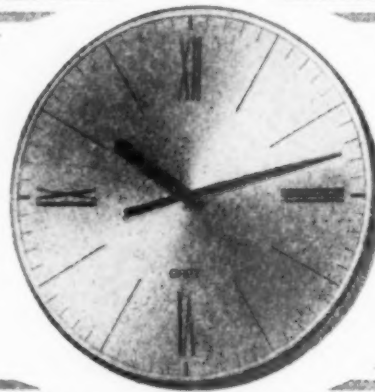


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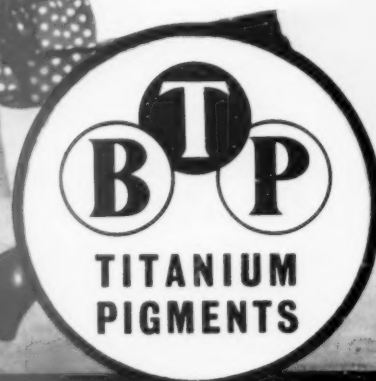
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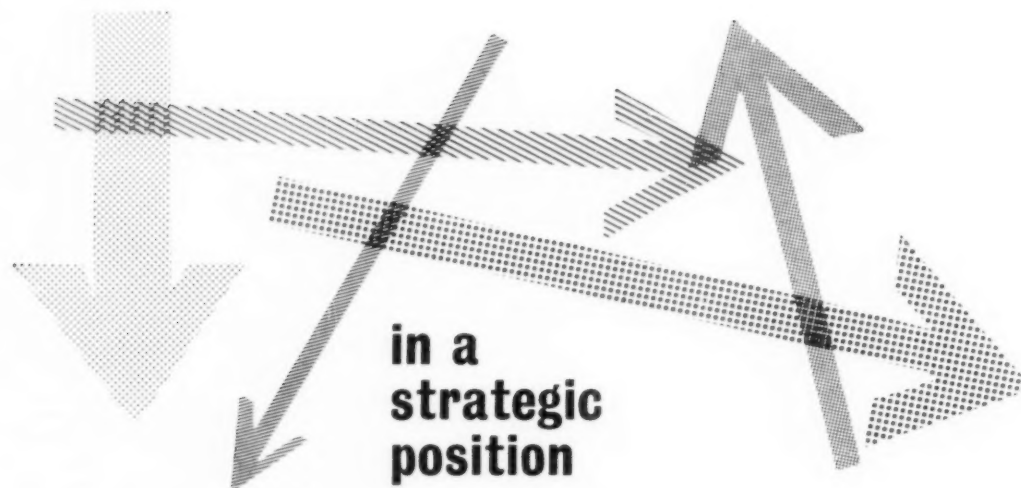
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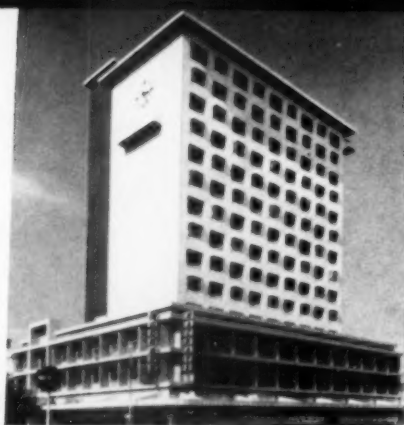
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For new buildings



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For old buildings



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by courtesy of the Rector and consultant Architect

**Proof of the
effectiveness of
these treatments
is shown in
this table**

		% Water absorption after 24 hours immersion	
		Initial test	Retested after 3 years' natural weathering
Sandstone	untreated	7.0	6.2
	DRI-SIL treated	0.1	0.2
Cement Block	untreated	6.0	5.9
	DRI-SIL treated	0.4	0.7
Common Brick	untreated	20.0	20.1
	DRI-SIL treated	0.1	0.3

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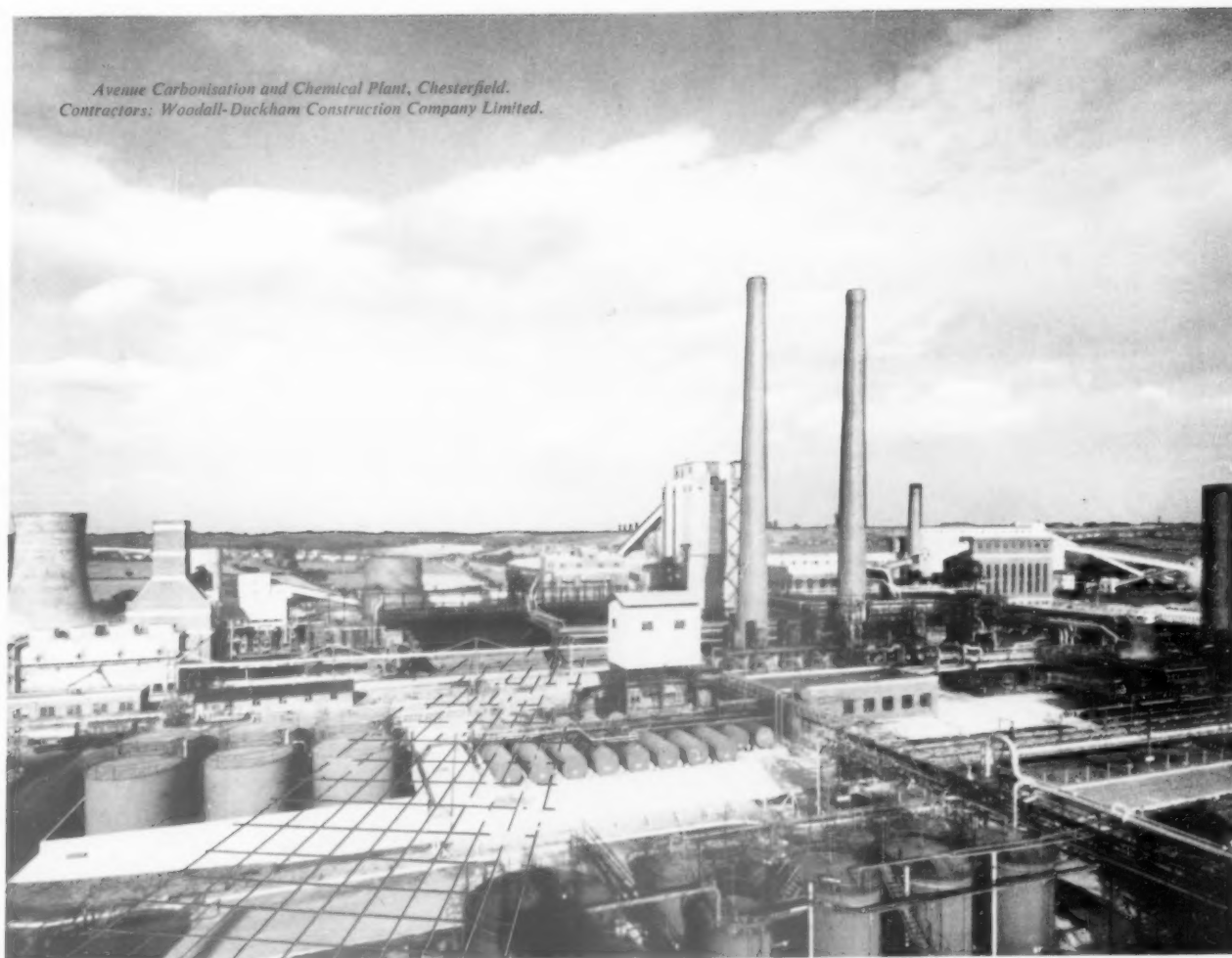


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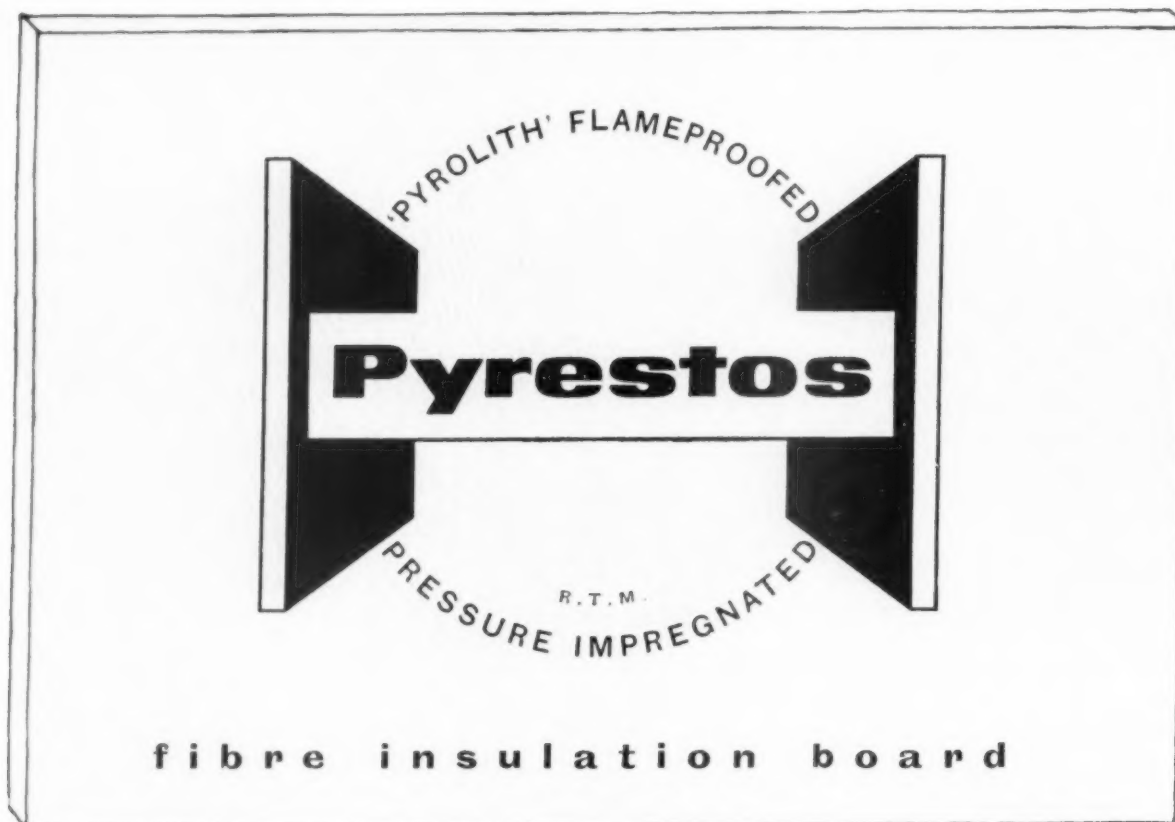
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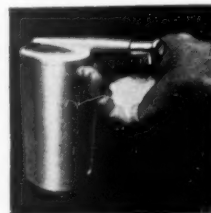
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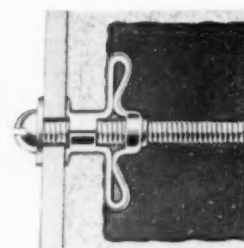
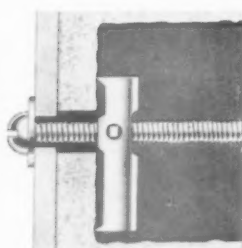
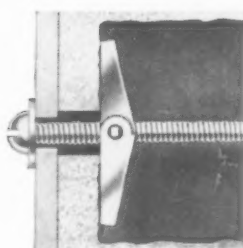
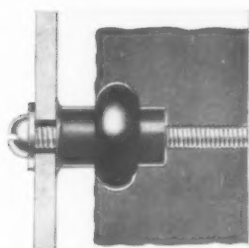
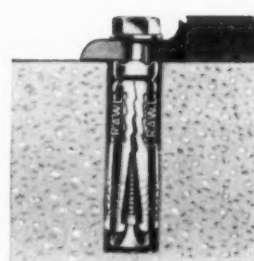
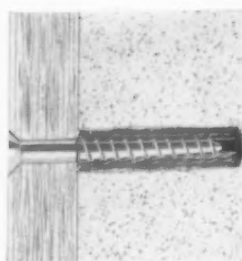
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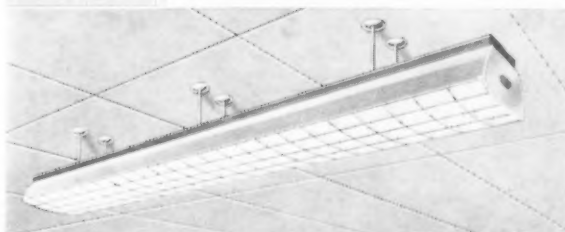
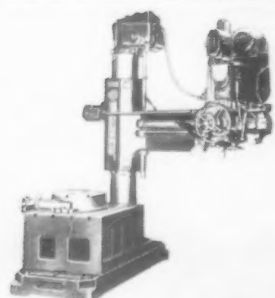
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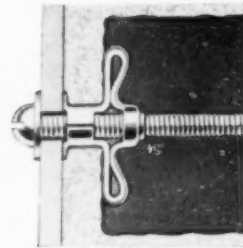
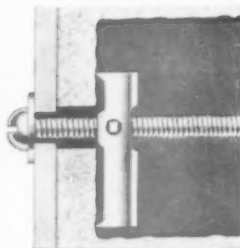
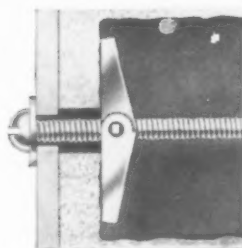
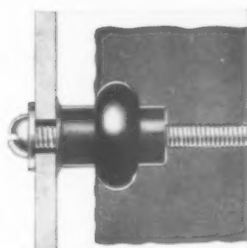
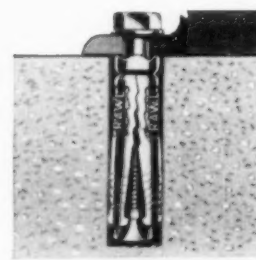
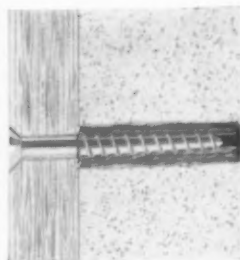
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Rawlplug fixing devices save you time and money

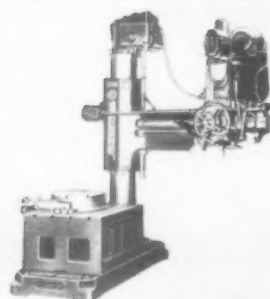
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Use the famous
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Screws.
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waterproofed and
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For bolting
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use **RAWLBOLTS**,
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Sizes up to 1"
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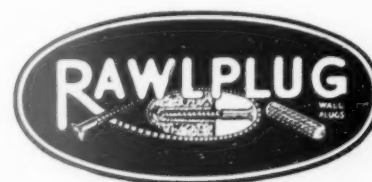


CAVITY FIXINGS The amazing **RAWLNUT**, screwed up from the
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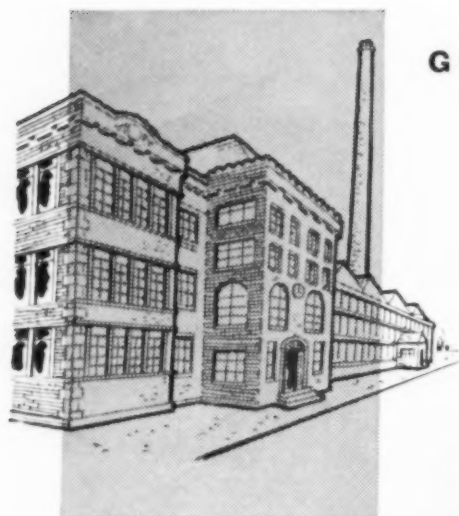
Rawlplug Fixing Devices always save time and therefore money, for it is a simple fact that on *every* screw and bolt fixing job, in solid *or* cavity materials, you'll make strong, absolutely safe fixings in *far less time than by any other method*.

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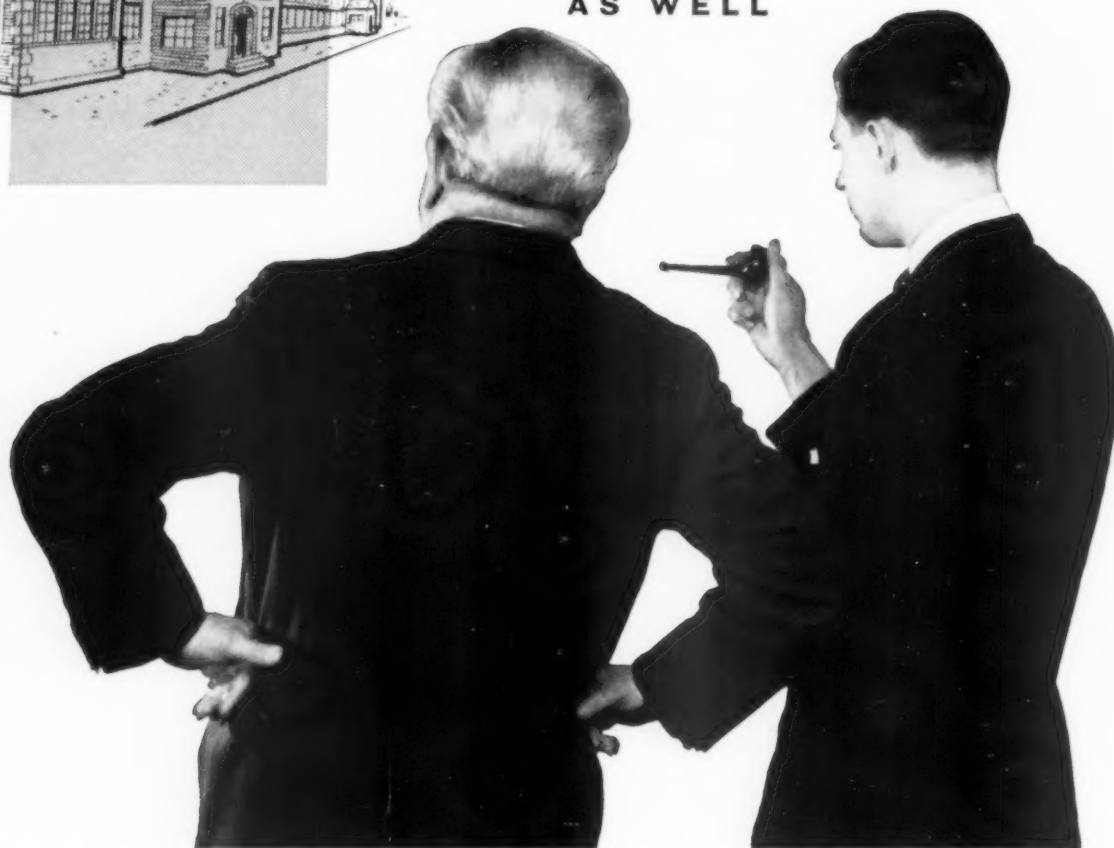


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Architects: Westwood Sons & Partners, F.F.R.I.B.A.

*  **BUILDING RESEARCH STATION TESTS** *
* When a standard-production TOMO WINDOW Wall-Unit *
* (8 ft. x 8 ft.) was tested at the Building Research Station, *
* Garston, the mean thermal transmittance of the complete unit was *
* found to be 0.31 B.Th.U. sq. ft. h. F. This is equal to the thermal *
* transmittance of a traditional 11-in. cavity brick wall! This *
* impressive result was further improved to 0.29 when the TOMO *
* pleated blinds, fitted between the panes, were lowered. *
* The U-value of the window-area only was found to be 0.38 which, *
* with TOMO pleated blinds down, became 0.35. At 0.38, TOMO *
* double-glazed WINDOWS are substantially (29%.) better than *
* the U-value of 0.47 quoted for conventional double windows in *
* the I.H.V.E. Guide to Current Practice, 1955. *

~~~~~

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UXBRIDGE, MIDDLESEX (Phone: West Drayton 3751)  
Please send me your 24pp. TOMO double-glazed WINDOWS brochure.

Name: .....

Address: .....

For the attention of: ..... AR 11

~~~~~

TOMO

DOUBLE | GLAZED WINDOWS

-BY TEST, THE BEST!

The natural choice for this fine new hospital building in Walton-on-Thames was TOMO double-glazed WINDOWS. Shown here are horizontal-pivot-hung and hopper-type windows and double-glazed doors in Utile framing. The spandrel below the window is in vertical cedar boarding.

The excellent thermal-efficiency achievement of TOMO double-glazing (amply demonstrated in the report of the recent B.R.S. Tests quoted below) was one good reason why these superb windows and doors were chosen for Walton Hospital.

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TOMO double-glazed WINDOWS afford all the advantages of finely-controlled ventilation and total indoor window-cleaning. They are suitable for inward or outward opening and can be top-hung, bottom-hung, side-hung or pivot-hung.

**FOR UTMOST EFFICIENCY IN
THERMAL INSULATION AND SOUND REDUCTION
—SPECIFY**

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DOUBLE | GLAZED WINDOWS

**—purpose-made in finest timbers
to Architect's size, style and finish**



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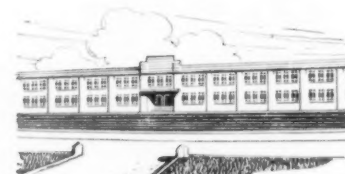
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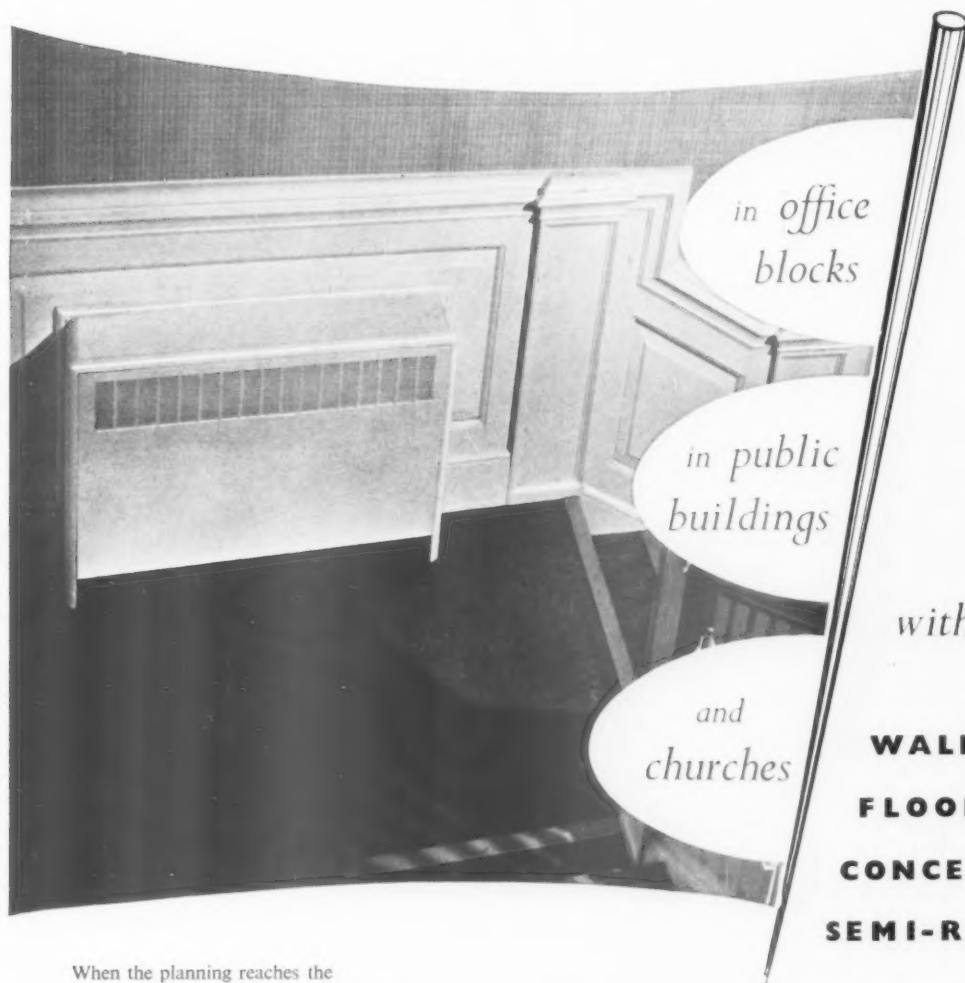
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Architects: Boots Pure Drug Co. Ltd. Archi-
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*in public
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*and
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The Music Room, Chatsworth House, Derbyshire.

Photograph by A. F. Kersting.

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Whether exponent of the traditional or contemporary, the Architect cannot ignore time. His works are judged through the passage of years, so too, the materials he uses.

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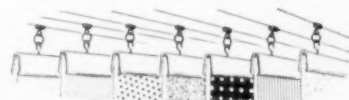
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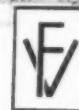
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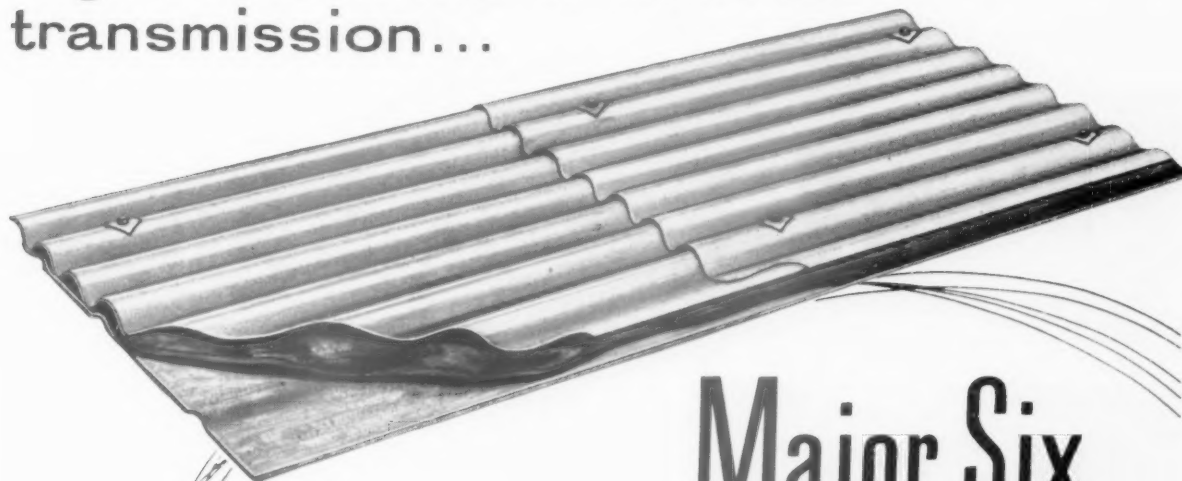


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It's the DOUBLE cladding that does it!—a rigid asbestos-cement underlining sheet laid directly to purlins as a soffit upon which the sheet of insulation is laid before putting the "Major six" sheet in position.



Photograph above illustrates interior view of roof



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Fittings designed with the User in mind. An entirely new range of fluorescent lighting fittings, produced by experts with many years experience, to combat the ever-rising costs of installation and maintenance.

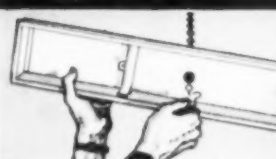
The **Essex Range** prices are very competitive with those of any fittings of the same standard, but only the **Essex Range** has all the precision built-in refinements such as:—

Detachable control gear tray, quick-fix reflectors and diffusers, heavy duty bi-pin lampholders permitting lamping from one position, no projecting screwheads on spine and many others.

Ask for a copy of the **EKCO Essex Range** Catalogue and see how good fluorescent lighting fittings can be.

- * *Installation and maintenance cost halved.*
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- * *Full range of quick-fix metal and plastic reflectors with open or closed ends.*
- * *Modern diffusers with coloured endplates—quickly detachable for ease of maintenance.*

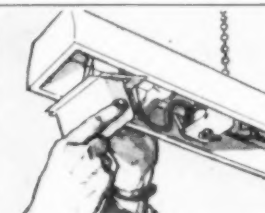
INSTALLATION IS A ONE MAN JOB!



1 Empty spine easily fixed to conduit, chain, universal suspension or ceiling. The 5ft. spine weighs only 7 lbs.



2 Control gear tray hooked at one end into spine, hangs vertically leaving both hands free to make connections. Tray swung into final position and firmly fixed with captive wing nut.



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Trusconversations 5

SCENE: *An architect's office*
TIME: *One of quiet concentration*

"Jimmy"

(No answer)

"James!"

"What's that? . . . Yes?"

*"Sorry to interrupt—how would you set about the concrete
steppings for this sports stand?"*

"Hy-Rib, old boy!"

"I'm afraid I . . ."

*"Can't go wrong! Good stuff—saves a lot on
shuttering. What's more, they'll do all the
drawings for you."*

"I haven't got much to spend—you know how tight . . ."

*"Not to worry. I've used it lots of times—
works out very well and they cut the price
recently—10%, I think. Truscon make it."*

"Do you think . . .?"

"Ring 'em up, old boy, ring 'em up."

Hy-Rib Division,
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Primrose coloured sink and double drainer made by Wokingham Plastics Limited.

More and more modern sink units are being made from 'Perspex' acrylic sheet. This one, made by Wokingham Plastics Limited has been installed in a new house. 'Perspex' will not chip, or rust and is not affected by hot water. It is smooth and easy to clean.

'Perspex' is light and can be heat

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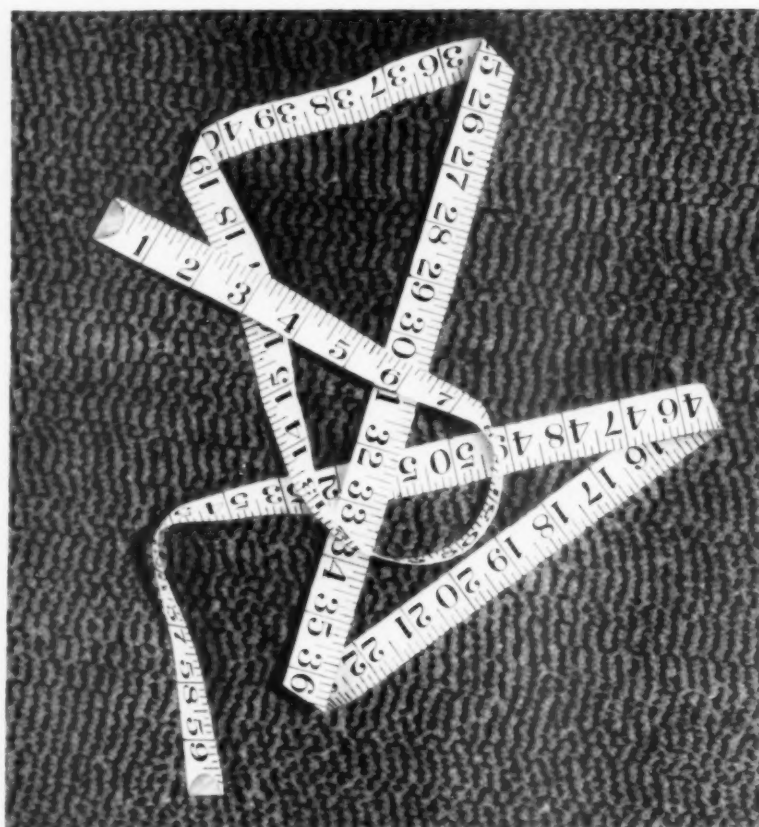
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P.678





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Any length and up to 33 ft. wide**

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8 COLOURS 5 qualities: Maine, Oregon, Nevada,
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Here is a carpet many an architect must have dreamed of—in form and colour thoroughly contemporary—in construction suitable for a wide variety of purposes—in dimensions the most adaptable carpet which is made anywhere to-day. And in price it is most economical because it is tailor made to your measurements and you only pay for the size you order. Here are the facts:

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Five qualities—Maine, Oregon, Nevada, Florida and Kansas.

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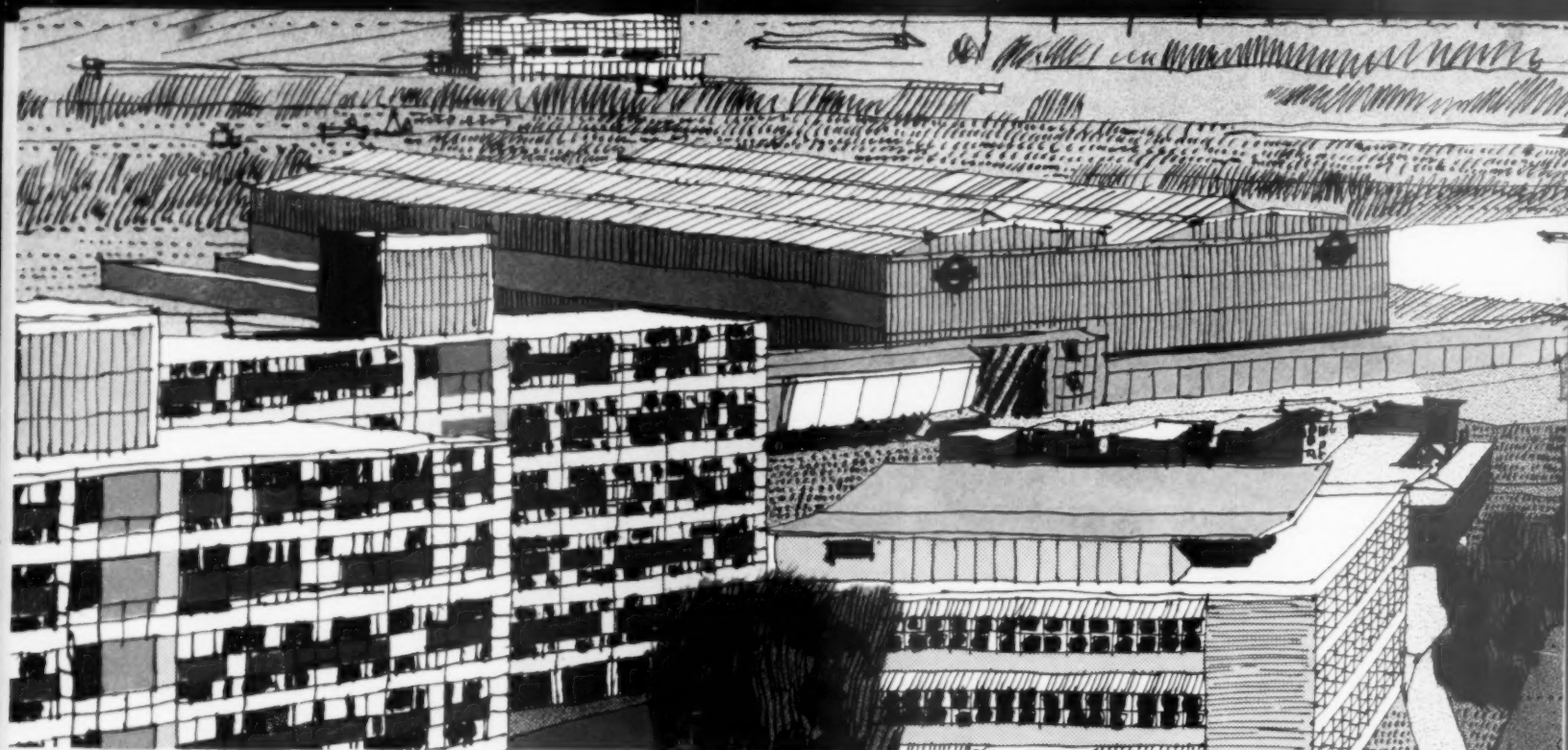
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sanitary ware

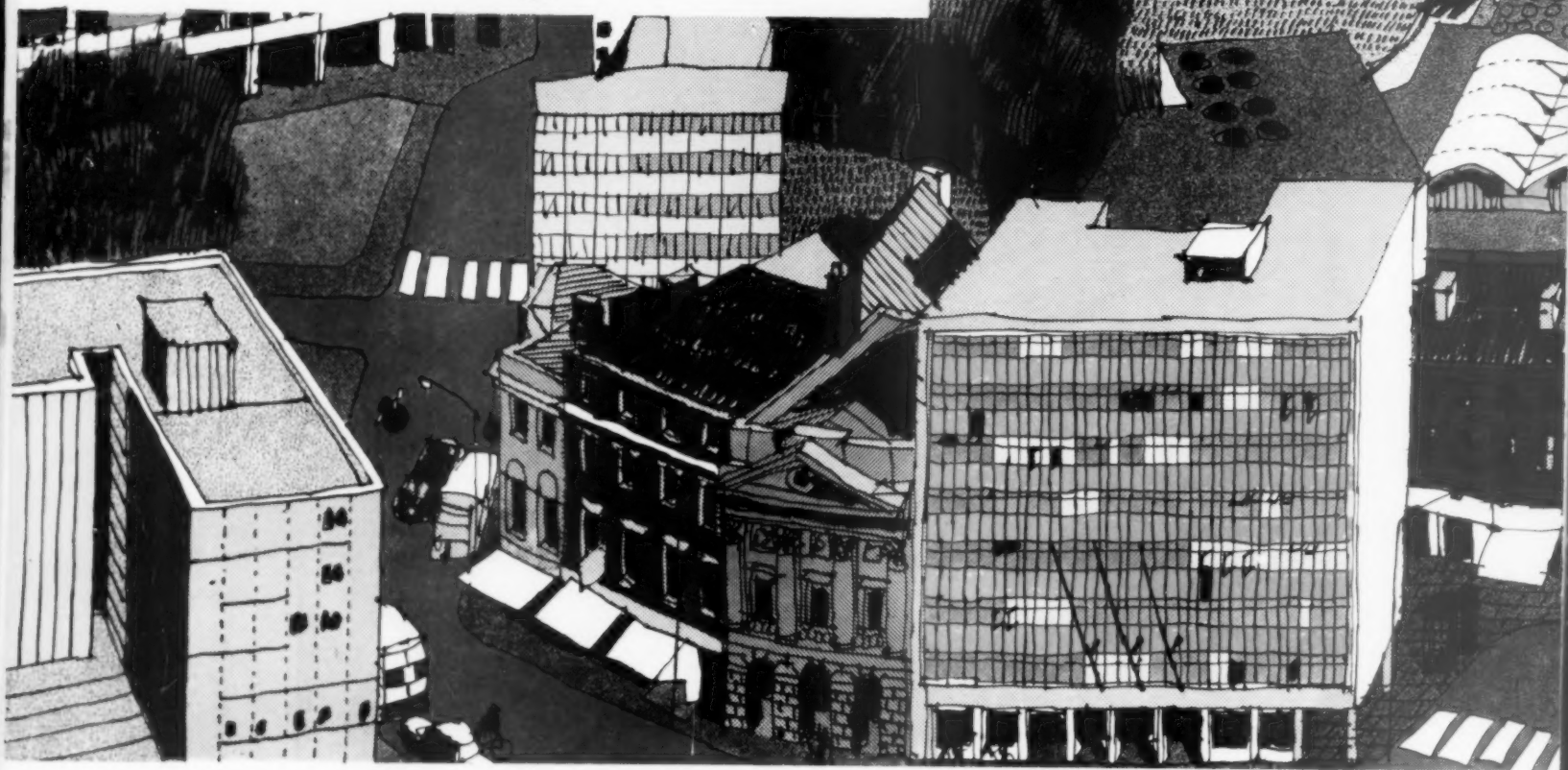
**in all industrial installations,
where hygiene is essential,
where rough usage is expected,
where maintenance costs
must be kept down.**

**With glazed fireclay, first cost
is last cost.**





The Glass Age is here



City of Britain

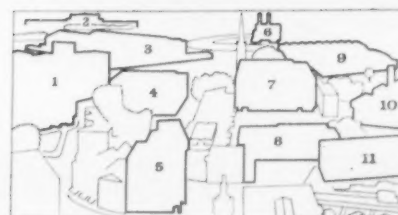
The components of this city already exist. The eleven contemporary buildings assembled here—drawn by Gordon Cullen—adorn different localities. They reveal the graceful and elegant shape of things

as they are and illustrate the part glass plays in the technique of the new Western Architecture which has arisen from the modern movement in design. The Glass Age is here.



- 1 Picton Street Housing L.C.C.
by the Architect to the London County Council.
- 2 Gatwick Airport.
Architects: Yorke, Rosenberg & Mardall.
- 3 Aldenham L.T. Bus Depot.
Architect: Thomas R. Bilbair, F.R.I.B.A.
- 4 McAlpine Offices, Hemel Hempstead.
Architect: M. H. J. Bebb, L.R.I.B.A., A.I.A.A.
- 5 British India Steam Navigation Co. Ltd.,
Aldgate, E.C.3. Architect: Theo Birks, F.R.I.B.A.
- 6 Stella North Power Station, Central Electricity
Generating Board. Architects: L. J. Couves & Ptrs.

- 7 Owen Owen's Store, Coventry.
Architects: Rolf Hellberg & Maurice Harris.
- 8 Bowater Research Development Co. Ltd.,
North Fleet Offices. Architects: Farmer & Darg.
- 9 Matthews & Mumby Works, Denton.
Architect: Haydn W. Smith, A.R.I.B.A.
- 10 Hunstanton School.
Architects: Alison & Peter Smithson, A.I.A.R.I.B.A.
- 11 Mitchell Engineering Buildings, Peterborough.
Architect: Howard V. Lobb & Partners.



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says Major J. H. HACKETT

Director of Hackett (Builders) Limited, Norwich

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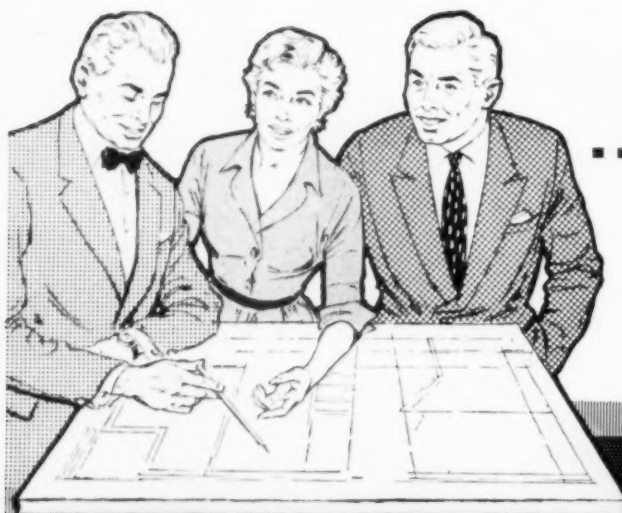
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TGA KD 14

The Architectural Review November 1958



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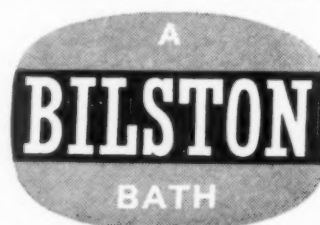
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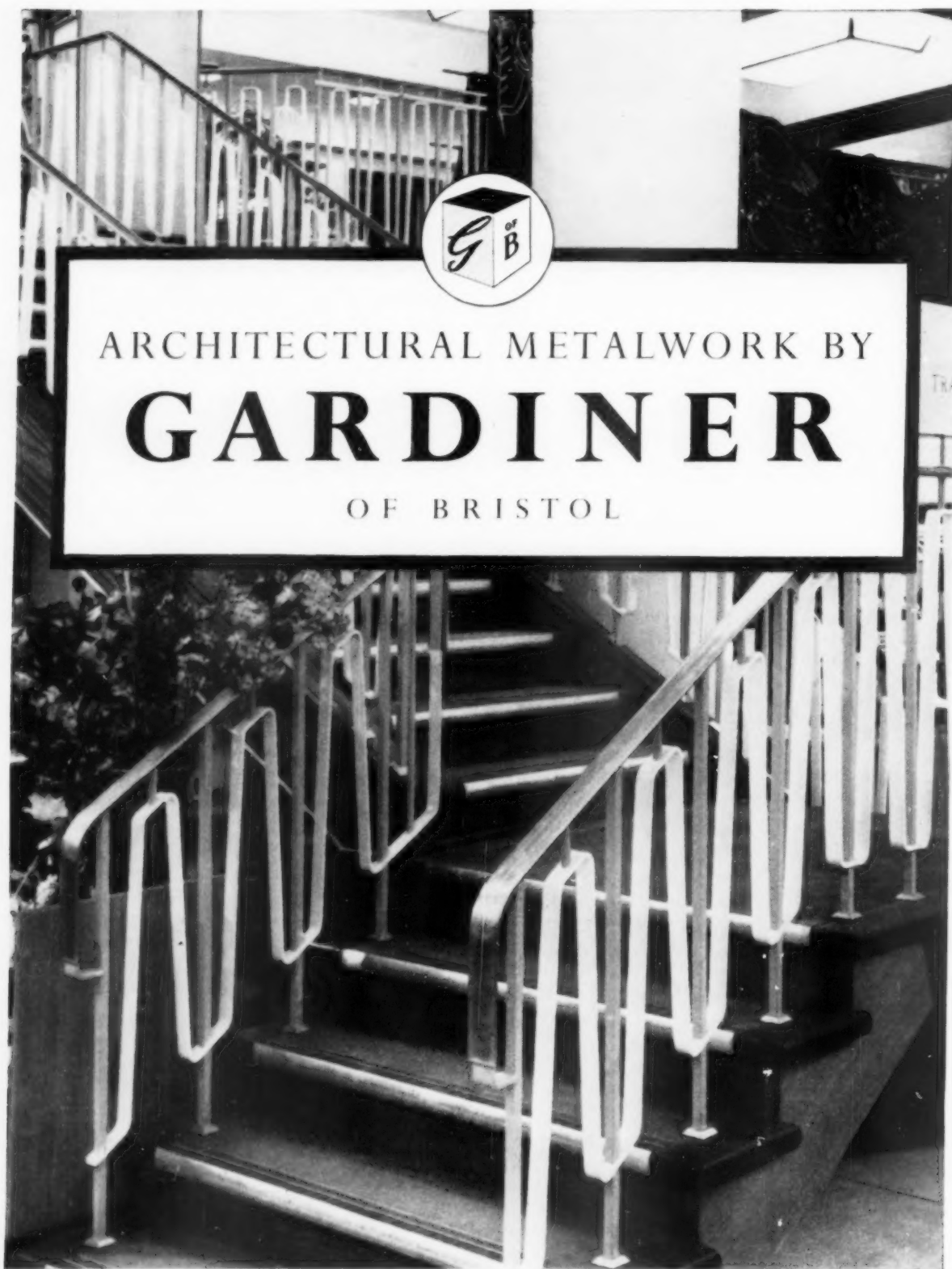
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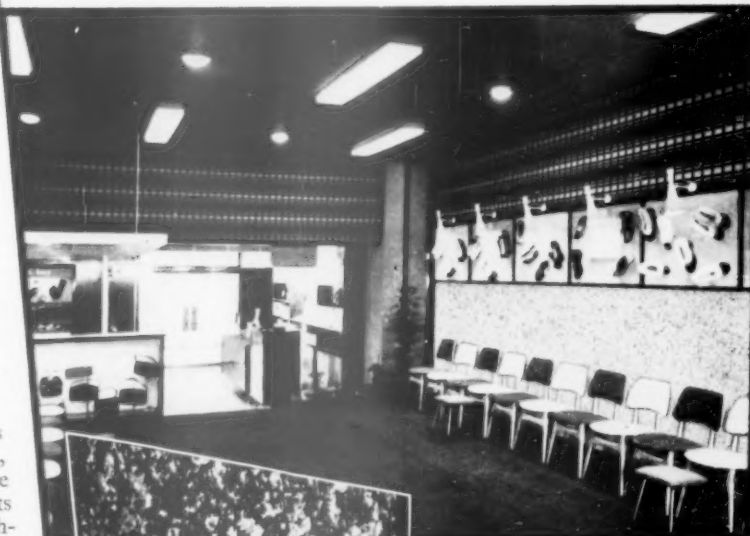
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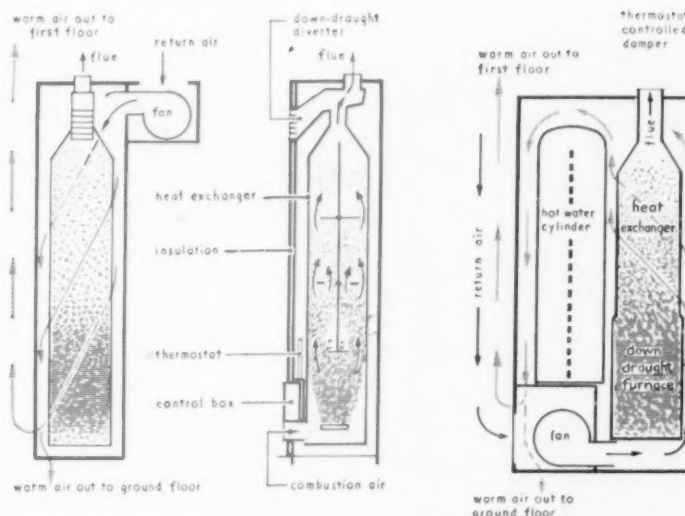
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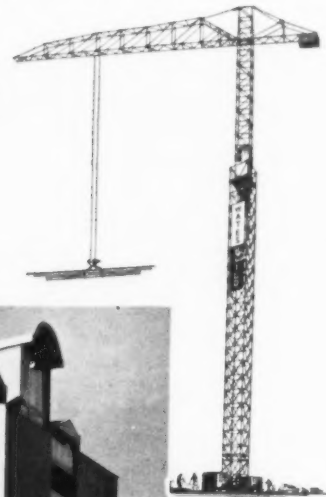
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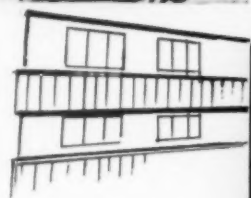
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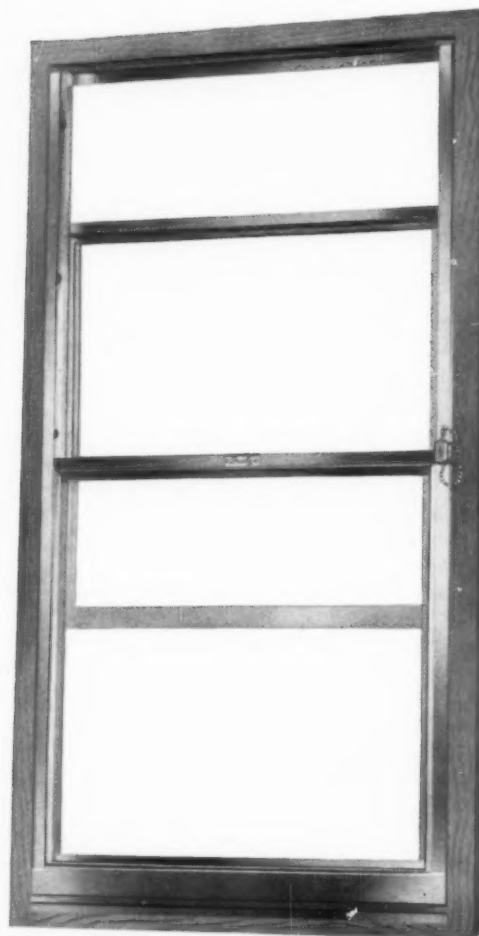
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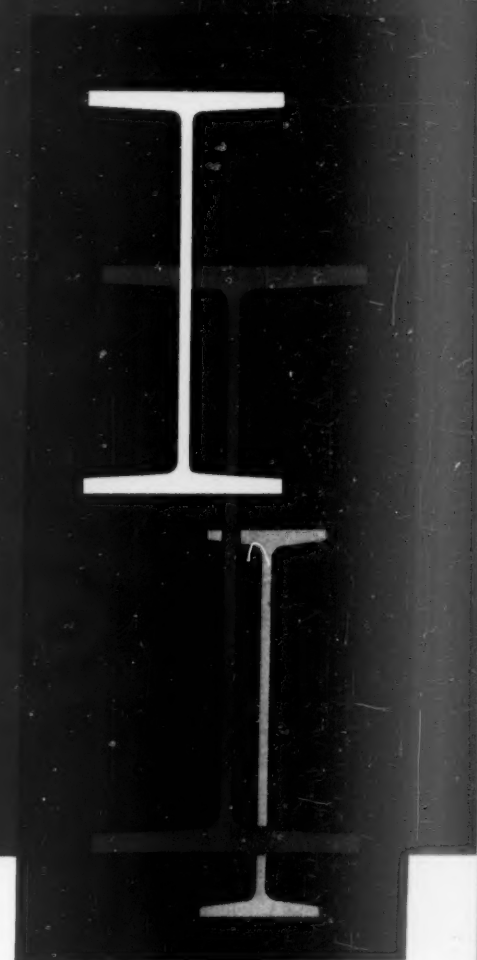
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The photograph of the Catterick bridge (shown at right) by courtesy of R. Sawtell, Esq., A.M.I.C.E., County Surveyor, North Riding, Yorkshire C.C.

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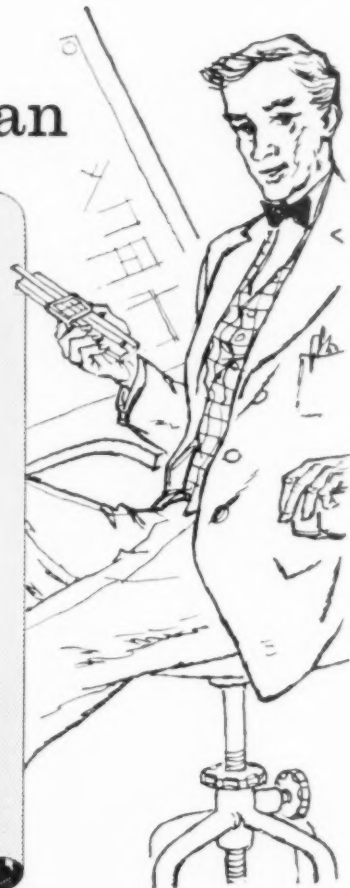
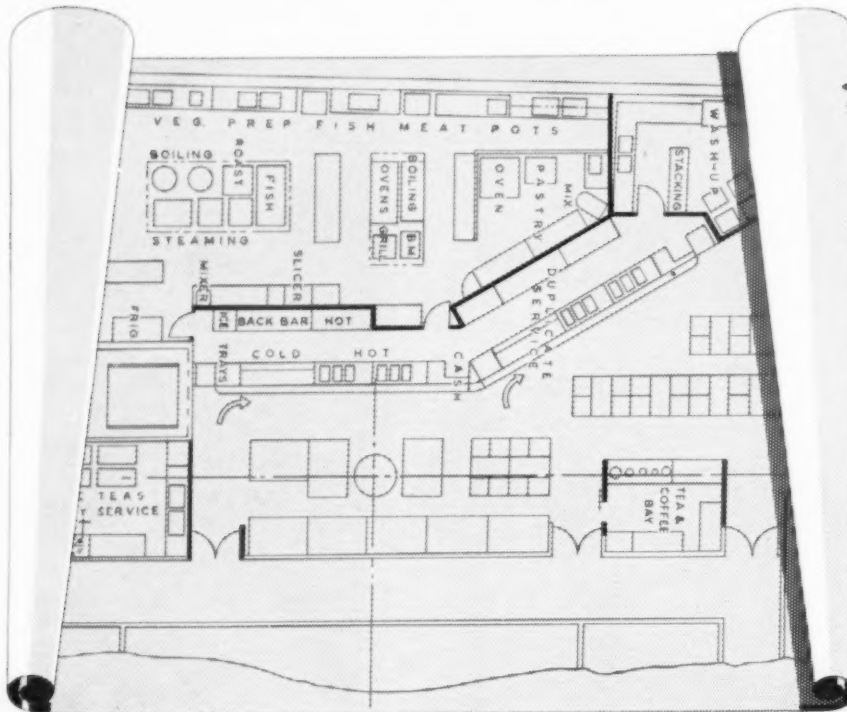
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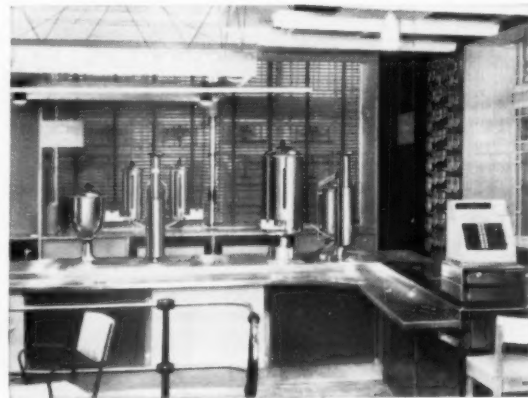
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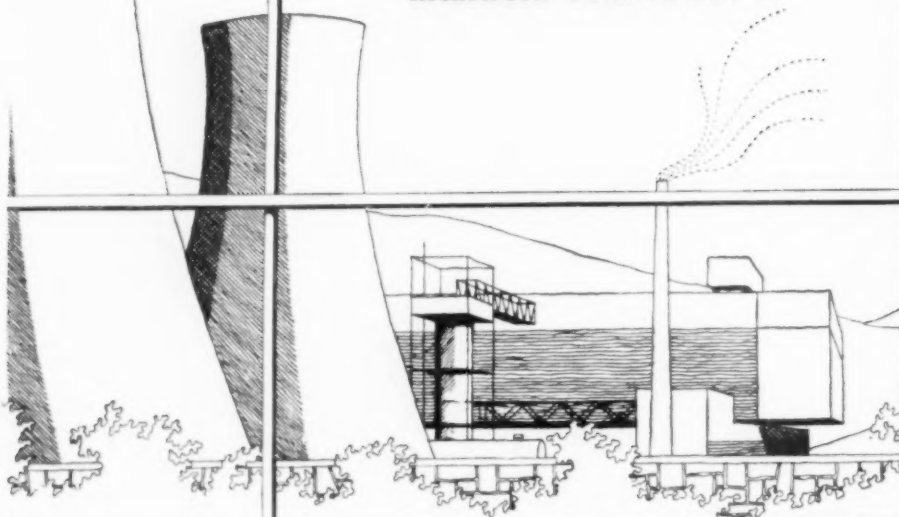
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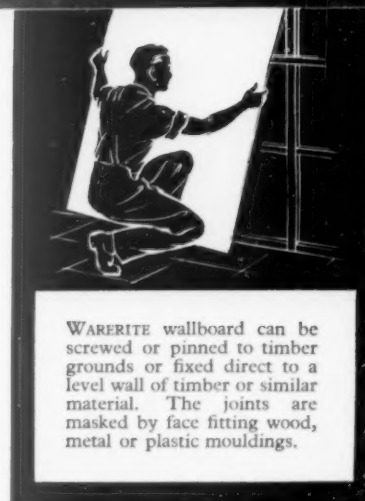


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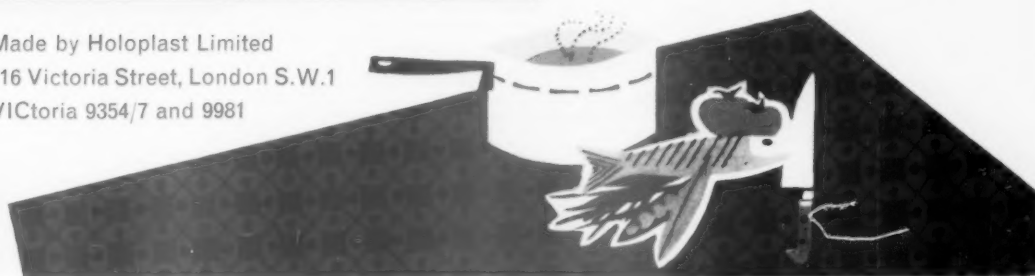
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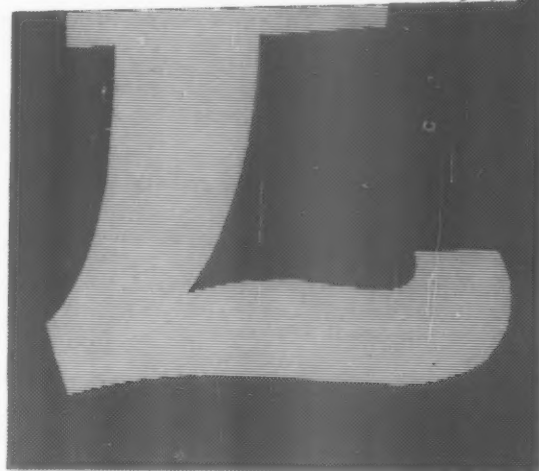
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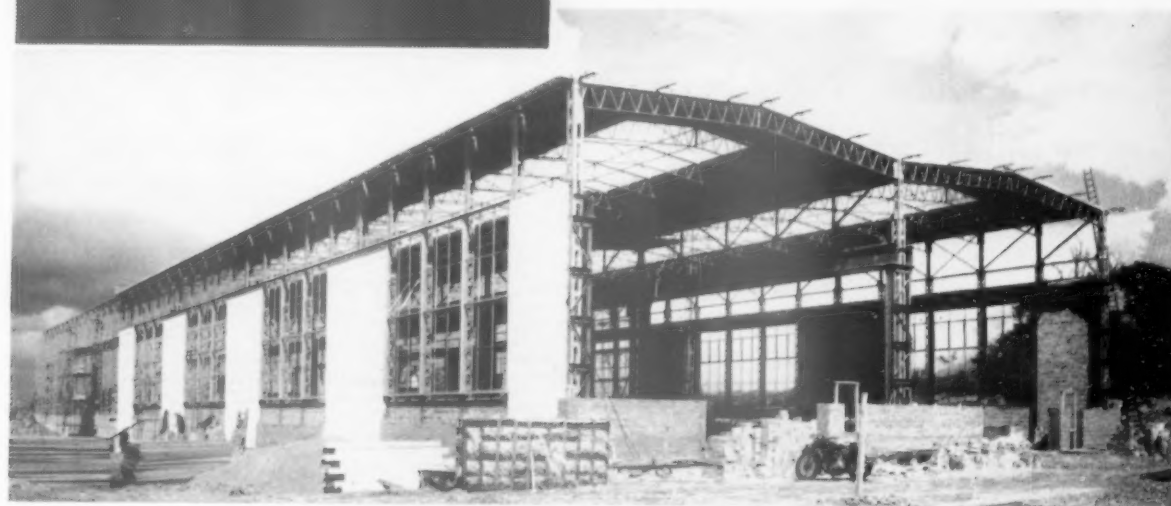


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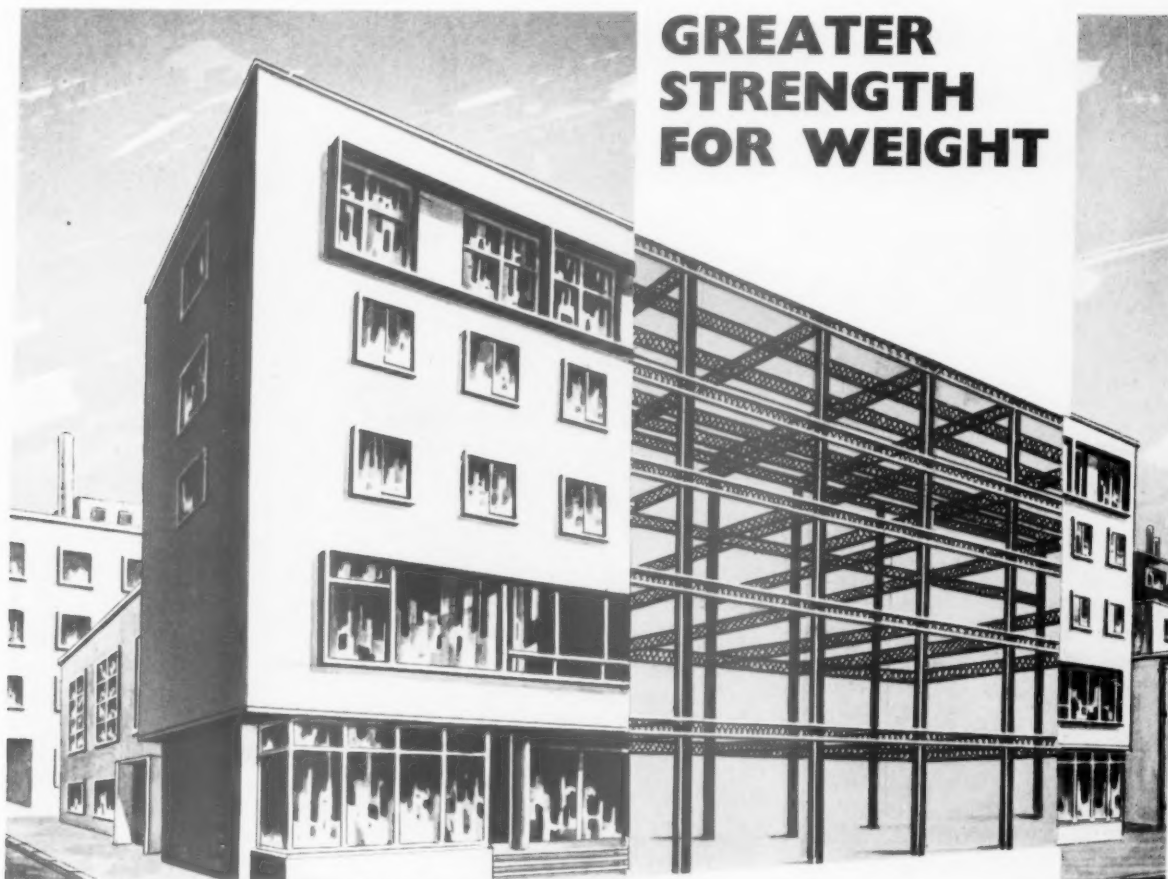
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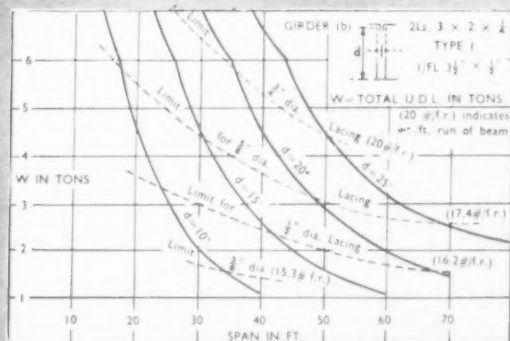
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WILLIAMS & WILLIAMS

'WALLSPAN' FOR EASTBOURNE LUXURY FLATS

1 The new 7-story Park Gates flats overlooking the sea at Eastbourne is, as far as we can trace, the first block of luxury flats in this country to have glass curtain walling. Wallspan was specified by the architect who was largely influenced by the detailing and way in which 'Wallspan' is designed for precision construction. This choice was amply justified in a trouble free installation.

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Williams & Williams Standard Metal Windows to BS.990 have been used extensively both in the 'Wallspan' grid and also in the brick facades.

Park Gates present a very elegant face on every side—no pipes are visible on the exterior of the building. Single stack plumbing is used and this is thought to be the first time that it has occurred in a seven-story building outside the L.C.C. area. The interior is equally carefully detailed—for instance television and telephone wiring is laid on to every flat and apparatus merely needs to be plugged in.

A novel feature is an annexe of ten bedrooms with private bathrooms which can be rented by tenants for their visitors' occupation.

BRITAIN'S TALLEST OFFICE BLOCK HAS ALUMINIUM WINDOWS BY WILLIAMS & WILLIAMS

2 Eastbourne Terrace, Paddington, has already been in the news for the fantastic speed at which construction has gone on. The 18-story tower block was 'topped out' almost exactly a year after work started on the site. Williams & Williams contribution to this notable achievement was the supply of 2698 double hung windows in aluminium. In the tower block from the 8th story upwards, the windows are double glazed for additional thermal insulation.

The steel windows used in the lift halls of the tower block etc. were also supplied by Williams & Williams while the links between the tower block and the wings are in 'Wallspan' infilled with clear glass.

The balustrading which runs round the cornices of the wings is also a product of the Williams & Williams group. The upstands are made of steel and the rails are aluminium.

'ALUMINEX' GLAZING GIVES IDEAL WORKING CONDITIONS AT NEW PERMUTIT FACTORY

3 The extensive use of 'Aluminex' Patent Glazing combined with the wide uncluttered floor space resulting from the use of portal frame construction gives exceptionally good working conditions on the floor of Permutit Company's new factory at Ealing. Great importance has been attached to this aspect of the new building and the whole project including the interior colour schemes was planned in detail by the architects and engineers. The factory floor area of approximately 36,000 sq. ft. is divided into three bays, two of which have electric travelling cranes running the full length. Canteen and toilet facilities including showers and lockers are grouped together as an extension of the adjoining office block where Williams & Williams provided the purpose made windows and lantern lights as well.

'WALLSPAN' CURTAIN WALLING AT LEEDS GRAMMAR SCHOOL

4 As can be seen from the photograph, interest is added to the long facade of the main classroom block by a 'picture window' treatment of the staircase wells using clear-glazed 'Wallspan'. The use of individual staircase access to the blocks of classrooms rather than corridors running through the building from end to end is an unusual feature. It comes about because the north/south facing block has to be built two classrooms 'thick'. The north facing rooms open on to terraces on the first floor and at the top of the building receive a measure of sun through roof glazing. 'Wallspan' is used also in the south-east elevation of the foyer linking the classroom and assembly hall blocks.

A WILLIAMS & WILLIAMS 'CO-OPERATIVE' CONTRACT

5 Everything in the new St. Helen's Co-operative Society store which Williams & Williams could supply—they supplied. 'Wallspan' Curtain Wall-

ing, purpose made aluminium windows, standard steel windows, 'Aluminex' Patent Glazing, 'Aluminex' Lantern Lights and pressed metal work. Quite an impressive list—and it had the added advantage that all these products could be integrated by the architect on one schedule so as to ensure a logical and easy-to-control sequence of delivery.

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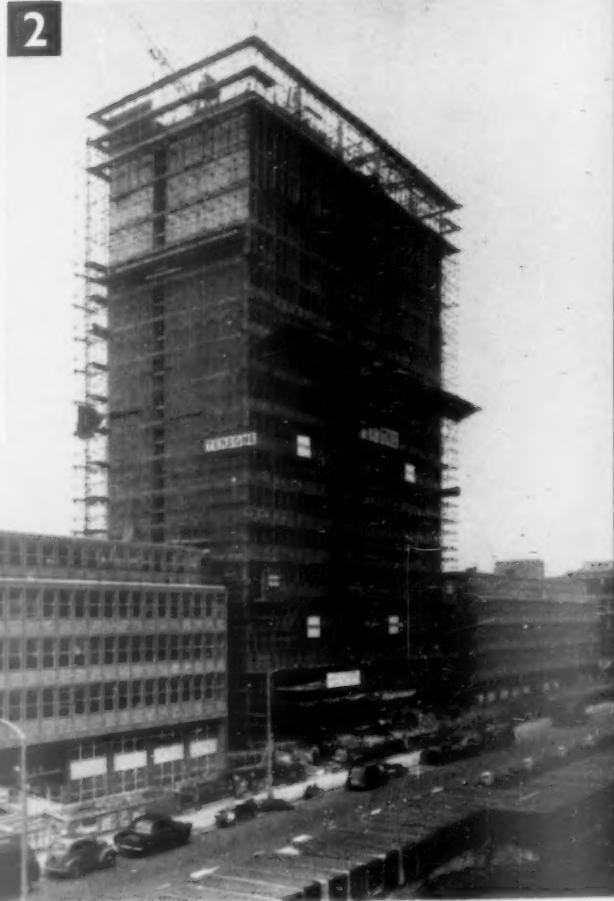
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- 1** PARK GATES FLATS, EASTBOURNE
Architect: H. Hubbard Ford, F.R.I.B.A.
Architect-in-Charge: S. Hoyer, M.A.A.
A General view showing the 'Wallspan' installation.
B Detail showing the Williams & Williams Standard Metal Windows.
- 2** EASTBOURNE TERRACE DEVELOPMENT, LONDON
Architects: Cecil H. Elsom & Partners.
Consulting Engineers: Clarke, Nicholls & Marcell.
Quantity Surveyors: Cyril Sweett & Partners.
Contractors: Tersons Limited.
Some of the 2698 Williams & Williams aluminium double-hung windows.
- 3** THE PERMUTIT CO. LTD., EALING
Architects and Consulting Engineers: Husband & Co.
'Aluminex' Patent Glazing in one of the portal framed bays.
- 4** TEMPLE MOOR GRAMMAR SCHOOL, LEEDS
Architects: F. R. S. Yorke, E. Rosenberg, C. S. Mardall, F.R.I.B.A.
North-western facade of the classroom block note the detailing of the staircase cladding.
- 5** C.W.S. STORE, ST. HELEN'S, LANCASHIRE
Architect: G. S. Hay, A.R.I.B.A., Chief Architect, C.W.S. Architect's Department, Manchester.
Architect in design: J. Douglas, A.R.I.B.A.
Six Williams & Williams products have been used in this building.



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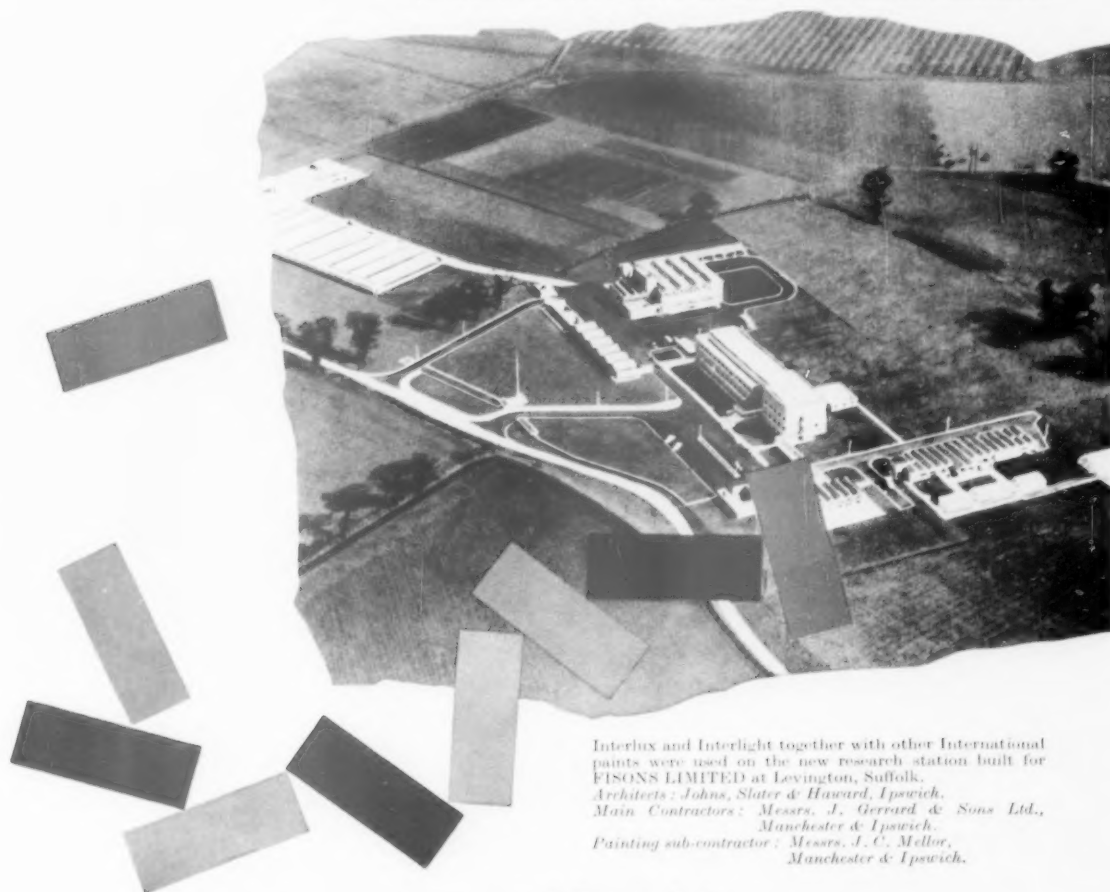
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MARGINALIA

Tornare ai Tempi Felici

It would have been incredible if the constant needling of the anti-Rationalists and the constant harping of the Zevisti on the 'Heritage of the Nineteenth Century' were to leave younger Italian architects untouched, but the results have turned out even more incredible than that. Suburban Milan, Turin and Novara can now bear witness to a return to the good old days before the Modern Movement—but only just before it. Gae Aulenti's house in San Siro, 1, a set of duplex apartments outside Novara by Gregotti, Meneghotti and Stoppino, 2, the Bottega d'Erasmus in Turin, 3, by Gabetti and associates, and a block of flats by the same team, 4, all bear various witness to a desire to return to a species of *Wagnerschule* inspiration, even to go to Mackintosh for ideas.



1, Gae Aulenti's house in San Siro, near Milan. Casabella.

This movement, which also numbers Giorgio Raineri (brother of the engineer Giuseppe Raineri) among its members, appears to be perfectly conscious of what it is doing, and has been defended in set terms by Aldo Rossi, who claims that these buildings show 'how necessary it is to recover the ways of a still meaningful past by means of the working out of a new architectonic language;



2, apartments outside Novara by Gregotti, Meneghotti and Stoppino. Casabella.



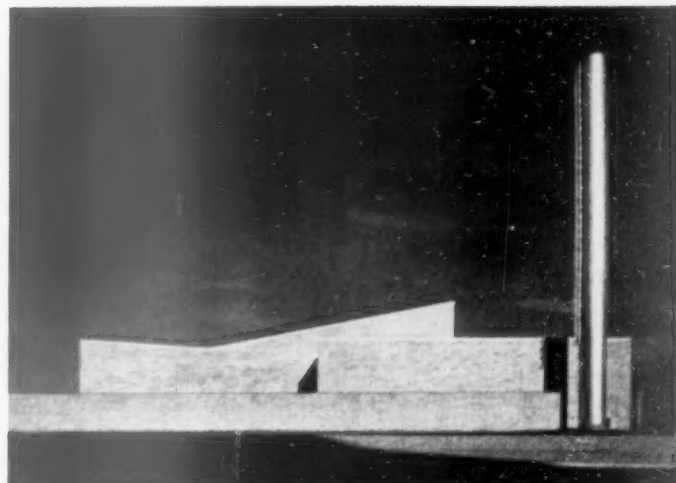
3, Bottega d'Erasmus in Turin.



4, roofscape in Turin.

working it into its background means here working it into the history of that background, which is one of the chief purposes of this architecture.' This is not necessarily double-talk, but a reference elsewhere in his polemic to 'the forms of a middle-class past' seems to cut rather nearer the bone of the matter.

This re-Bourgeoisification (to use a Marxist term that seems not inappropriate here) of north Italian architecture is probably no more than a parallel programme to that *andare al popolo* that produced the surge of interest in peasant architecture two Triennales ago. But one observes that the earlier attempt to adjust to consumer tastes needed no defence and was achieved without loss of balance by the architects involved. This new attempt to get on all fours with the taste of the occupants seems far less sure either of itself or its professional acceptance.



5, Arne Jacobsen's cylinder-boring plant at Aalborg.

Very Pure Forms

It is one of the oddities of current architectural mythology that northern opinion still asserts that pure clear forms come from the Mediterranean and the south. In spite of the current Italian preference for wandering façades, argumentative roof-pitches and shaggy surfaces, in spite of the fact that the great masters of pure form in our own time—Mondrian, Ben Nicholson, Mies van der Rohe—are all northerners, the myth persists. In spite, too, of the work of Arne Jacobsen, whose refinedly Euclidian town hall at Rodovre has already been the subject of wide comment (cf. *Marginalia*, March, 1957) and has now been backed up by the even more strikingly pure geometry of his cylinder-boring plant at Aalborg.

5. Jacobsen's case is extreme, but that does not prevent it being typical of a substantial body of opinion among northern architects—an attitude of such meticulous purity is not, really, to be wondered at in cultures with a strong puritan tradition, the mystery is why this ideal should be wished on the catholic south.

Tall Block in Trieste

Among the most instructive recent European examples of inserting into an elderly environment a new block that practically doubles its vertical scale, is the development between the via San Francesco and the via del Coroneo that now towers above the roofs of central Trieste, 6. Designed by the enterprising Studio Valle, a



6, block of shops, offices and flats in Trieste designed by Studio Valle. Casabella.

family design-office in Udine, the present tower of thirteen storeys, with a low block towards the via San Francesco, is only half the total bulk of the scheme, which will also include another tall block, as high as



7, location plan of the Trieste block.

the first, on the via del Coroneo side, 7. The completed project will have shops on the ground floor at both these main street frontages, and also along the sides of a sottoportico, running from street to street under the two towers, providing a pedestrian underpass. Judgment, obviously must be reserved until the second tower is completed, but the project promises extremely well, both as large and small-scale urban scenery, and takes even further the 'top-heavy silhouette' idea pioneered by BBPR in the Torre Velasca at Milan (AR Marginalia, August, 1957).

Architectural Historians

In August of last year the REVIEW reported the inaugural meeting of a Society of Architectural Historians of Great Britain, inspired by the American SAH. In August this year the first full-scale Annual General Meeting took place at York. Prof. Cordingley was elected President, Dr. Singleton Chairman and Mr. Frank Jenkins Hon. Secretary.

Prof. Geoffrey Webb gave the formal address on the Historiography of Architectural History in England. In the beginning was Britton, whose efforts were mainly directed at providing precedence for the architects of his time, whereas later historians provided history for its own sake: Willis and Prior were the outstanding people, the latter in particular found things out 50 years before Frankl did. On the other hand there was some German influence of the Riegl-Wolfflin School. John Gloag gave a very interesting account of the development of the domestic window in relation to glass-making. Miss Lang was controversial in maintaining that architects of the Quattrocento worked from the plan up and thought in surfaces and not in space. Dr. Peter Murray showed colour slides of the newly restored Home House (now the Courtauld Institute of Art) and discussed the Adams' aesthetic theory. The house has very largely been brought back to its pristine state and its restoration is a model achievement. These papers were followed and crowned by Prof. Russell Hitchcock's talk on the early Gaudi. Seeing all his early achievement, deriving from Gothic Revival architecture mixed with Moorish motifs, one can now understand how the buildings of his maturity came about and can only hope that this talk and the illustrations accompanying it will be published in full.

CORRESPONDENCE

High London

To the Editors.

SIRS,—Although so much of what he says in 'High London' is true, thoughtful and wise, I suggest that Mr. Richards has made, or accepted, a number of assumptions which should be challenged.

First it can, I believe, be proved that very high housing densities can be achieved by building about 50 ft. high. High housing is not a planning necessity. This means streets, a rude word. Why?

Secondly it is clear that high office buildings are unnecessary; the same floor area, though probably not quite so convenient, can be produced by other means. Taking London as a whole, this is obvious.

Thirdly tall buildings complement one another. I profoundly disagree with Mr. Richards' judgment that 'The pattern to aim at is one of isolated towers judiciously spaced among buildings generally no higher than at present.'

Fourthly I do not believe that 'a good relationship between high and low blocks' means very much—is there truthfully any relationship at all?

Fifthly I am very suspicious of single-viewpoint judgments, for instance, here, that a new office building near the Tate 'will provide the London landscape with a vertical punctuation mark just where it is needed.' I do not doubt Mr. Richards' word about this but he is not dealing with one view—or a small city such as Mantua—but with numbers of towers and of course thousands of viewpoints. It is an argument that can be dangerously forced, unless there is virtually only one view. Except on purpose, one never looks at a town or a street and I believe that the 'architects' of the Georgian London estates realized this, that it is the secret of their splendid urbanity. A town really should feel right rather than look right—preferably both.

Sixthly the sectional area of a tower, absolutely and not only by proportion, is what makes it 'slim' or otherwise. About 40 ft. square I suggest is the maximum. (This area is useless for almost all purposes.) This is not so daft if it is admitted that a 2-in. diameter scaffold tube always looks slim, a 3-in. one always disproportionately fat. I believe that there are many other 'absolutes' of this kind, e.g. ceiling heights, and that they all depend upon human scale. Slabs are less predictable.

Does all this perhaps point to groups of tall buildings, placed where they will dwarf neither St. Paul's nor the Royal Parks? The City is already something on these lines, when, at weekends, one can see it. It feels fine.

Yours, etc.,

JAMES CURRIE.

Gloucester Place,
W.1.

Art Nouveau

To the Editors.

SIRS,—The REVIEW's preoccupation with Art Nouveau continues to be as baffling as ever. It must, of course, be admitted that this style, if it can be so called, is interesting because of its complete break with traditional design and ornament, but what does this amount to? Art Nouveau was mannered, over-sophisticated, and, for all its novelty, as decadent as that other field of Dr. Pevsner's scholarship, the Egyptian Revival of the late eighteenth century.

Purely by chance, certain architects connected with Art Nouveau or the Jugendstil, working from an entirely different standpoint, occasionally produced results which in some way anticipated certain features of modern architecture. So what happens? Van de Velde and Horta become 'pioneers of the modern movement,' and the trivial fancifulness which is the basis of the fashion is even compared with Ronchamp! This is incredible.

If the allusion to Blake's 'part in the creation of Art Nouveau' by Dr. Baumann has some truth in it, it merely serves to show how incompletely the little men of the period understood the work of an imaginative artist with a unique personal vision. Certain artists of real stature were, admittedly, influenced by, or themselves influenced, this short lived craze. This was quite natural. In the Europe of the nineties, Art Nouveau couldn't be avoided, and its strongly anti-academic bias persuaded some artists to see more in it than there really was. Anyway, it didn't do Whistler or Toulouse-Lautrec any harm. Their genius transcended the limitations of the sources of their art. Moreover, in the case of Lautrec, it is quite reasonable to consider that the further he departed from the style of his over-rated posters, the finer and more sensitive artist he became.

The time factor, the date to which Art Nouveau can be traced back, is of little significance. Why, while Horta's little bag of tricks in the Rue du Turin was being built, the Chicago style was flourishing, and Frank Lloyd Wright was beginning to design a series of houses which rank with any of his more recent work. Some years later, in 1908, Adolf Loos gave Art Nouveau even more of a blasting that it deserved. Behrens' Berlin factory of 1909, contemporary with the beginnings of Cubism, showed no Art Nouveau influence whatever, and from then on the few genuine creative minds who had dabbled in Art Nouveau for a time felt free to cast it aside, while such of the younger men as were aware of its existence may well have found its lingering presence an embarrassment, a stale fashion still trying to pass itself off as the New Art.

Yours, etc.,

GEOFFREY NEWMAN.

Hove.

Counter Attack

To the Editors.

SIRS,—It was good to see the note in your June issue, exposing the tragic mess that has been made of Ware, although the full horror of recent happenings is only hinted at. The 'windy desert with a too-large public lavatory,' for instance, is a remnant of the lovely grounds of the Priory, given by a generous resident to the town. It was then a sanctuary in the centre of the town, screened from the streets on every side. A castellated gate arch with solid doors led into a tunnel of evergreens, by way of which the grey Priory in its sunlit gardens beyond was gradually revealed to the visitor. But this was too gloomy and old-fashioned; down came the great gate (to celebrate the Coronation) to be replaced with puny iron gates on mean little piers; away went the shrubs and conifers in favour of flat turf and concrete kerbing; and now the Priory can be seen from any passing bus and all the passing buses can be seen from the Priory grounds. The laying of a sewer through the gardens was an excuse to fell most of the remaining trees to 'open up' a view of the river,

and incidentally of industrial development beyond.

The Town Council's policy of 'opening up' the centre of the town is responsible for the natty flowerbeds you illustrate, which replace small houses once clustered in the shadow of the church. The last of these are now threatened by a Clearance Order. The Council's officials claimed the cottages were perished beyond repair and dangerous to health; the S.P.A.B. produced plans to disprove the first claim, and a spry octogenarian tenant of one of the cottages disproved the other.

The clearance of the huge empty site you mention was a holocaust of antiquity; medieval timbers and kingpost roofs, Elizabethan wall-paintings, a Regency assembly room, all gathered round a handsome red-brick Georgian inn, were swept away. If the comfortable old town centre were being destroyed to make way for a new and nobler Ware, the loss could be borne, but the homeliness of brick and tile is replaced by carpets of concrete dotted with municipal bedding plants, and the featureless new housing estates seep further into the woods and fields about the town.

Yours, etc.,

GORDON MOODEY.

Hertford.

Note

Overseas readers may have the REVIEW sent in a flat packing by notifying the subscription department.

CORRECTION

In 'The Barometer of Milan' in MARGINALIA, July, 1958, it was stated that the display on the History of Building Structure was the work of Carloni. It should have been credited to Erberto Carloni, Marcello Grisotti and Agnoldomenico Pica, and we apologize for this omission.

ACKNOWLEDGMENTS

FRONTISPIECE, page 284, P. Smithson. ITALIA NOSTRA, pages 285-287: 1. Foto Cielo; 2. Italy's News Photos. ENGINEERING OF EXCITEMENT, pages 294-308: Frontispiece, 4-7, 9-10, E. Lang; 2. Techniques of Architecture; 8. F. Futcher & Son; 11. Joachim Diederichs; 12, 28, 34, C. Robinson. Arphot; 15-16, J. Bjaugaud; 17, M. Mizuki; 18, G. Lamora; 19. Photo duprat; 20, Bjaugaud et Habang; 21, 22, Mac Mizuki; 23, V. Muniz; 24, 25, 26, B. Kotz; 27, J. Nisberg; 32, J. Stirling. DEATH OF A MONUMENT, pages 309-311: 7. Milano Oggi. BUILDINGS BY JOHN B. PARKIN ASSOC., pages 312-318: 1-3, G. Milne & Co.; 4, 5, 7, 8, J. Parkin; 6. 'The Canadian Architect'; 9-13. Panda. BULSTRODE, pages 319-320: 1, 3, Trustees of British Museum; 4. Faber & Faber; 5, 6, Sir J. Ramsden; 7, J. Harris. INTERIOR DESIGN, pages 321-326: 1-5, A. Cracknell; 6-8, H. K. Nolan, Arphot; 9, G. McLeish; 10, 11, Mann Bros. DESIGN REVIEW, pages 327-328: 1, 2, H. K. Nolan, Arphot; 3-6, G. McLeish. CURRENT ARCHITECTURE, pages 331-334: 1, 3, 4, C. Westwood; 2, J. Maltby; 5-7, Galwey, Arphot; 8-9, J. Maltby. MISCELLANY, pages 335-342: Exhibitions, 1, 2, Whitechapel Art Gallery; 3, G. M. Butcher; 4, Gallery One, World, La Tourette, 1-3, P. Smithson. Counter Attack, Nairn, Arphot. Townscape, Potted Jungle, 2, 3, I. de Wolfe, Arphot; 4, 5, I. McCallum, Arphot. SKILL, Metal Finishes, pages 343-346: 1-16, Galwey. The Industry, pages 348-350: 4. Stevenage Publicity Department; 5. Cheltenham Publicity Department.



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THE ARCHITECTURAL REVIEW

Volume 124 Number 742 November 1958



The Cover shows five theoretical studies of structural forms made by students of the American engineer Eduardo Catalano—forms such as have served to stimulate that engineering excitement that is discussed in Robin Boyd's article on page 294. Whatever the future of this excitement—whether it will cool and settle down to a few accepted non-rectangular forms, or whether architects will force engineers on to ever more spectacular shapes—it marks a watershed in the development of modern architecture as decisive as Auguste Perret's domestication of reinforced concrete fifty years ago.

281 Marginalia

284 Frontispiece

285 *Italia Nostra* by Georgina Masson Italy, with more spoils towns and a disintegrated public opinion, has Outrage problems that are proportionately worse than England's. Few organizations have interested themselves so far in the defence of the Italian scene, but the formation of *Italia Nostra*, three years ago, means that there is now 'an association for the protection of the national artistic and natural heritage,' on a country-wide scale, enjoying influential backing and support. Miss Masson gives an account of the formation of this fighting organization, the battles it has already fought in Vicenza and Cremona, the support it has given to local bodies, funds made available for restoration work in various parts of Italy, the legislation it is supporting, and the struggles that lie ahead of it.

288 *Buildings in Lagos: Architects, Architects Co-partnership*

294 *The Engineering of Excitement* by Robin Boyd Buildings with warps, waves, folds, droops, and other non-rectangular forms are becoming more and more the order

Directing Editors J. M. Richards
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of the day; the idea of modern architecture as geometrically restrained within a few simple and regular shapes seems to have passed away, and is being extended, if not totally replaced, by a repertoire of structural devices whose exciting silhouettes are held to be the responsibility of the engineering profession. However, as Mr. Boyd makes clear in this article, the original responsibility more often lies with the desires of architects to break away from the established formal routines of the International Style, and calling in the services of engineers to help devise more exciting shapes. The prospects for architecture that emerge are equivocal—a world of endlessly-repeated exciting paraboloids and domes is as daunting a prospect as one of endlessly repeated rectangular grids, and even a world which offers a judicious and mutually enhancing mixture of both will need more heart, and less self-consciousness than the extreme proponents of either can offer at the moment.

307 *The Exploring Eye: Death of a Monument* Because the inhabitants were warned in time, no-one was injured when the Campanile in the Piazza di San Marco fell. But if the Piazza had been entirely cleared, who took—or who faked—the photograph of the tower collapsing, and what is its value as historical evidence?

310 *Two Buildings* by John B. Parkin Associates

319 *Bulstrode* by John Harris Much of the history of English domestic architecture lies bound up in houses that—in their present condition—do not necessarily strike the eye as architecturally remarkable. Such a house is *Bulstrode*, and in its time it has enjoyed the attentions of many architects and decorators of note, from an unknown classicist of the sixteen-forties, to Benjamin Ferrey in the eighteen-sixties. Perhaps its greatest glory was, as Mr. Harris points out, that its chapel, in the middle seventeen-hundreds, had the only complete decorative scheme carried out by any of the Italian artists who came to England in anticipation of the competition for the painting of the dome of St. Paul's—in this case, Sebastiano Ricci.

321 *Interiors: Showroom and Offices at Gt. Portland St., W.1: Architects, Chamberlin, Powell and Bon*

323 *Interiors: Offices in Chancery Lane, W.C.2: Architects, J. M. Austin-Smith & Partners; partner in charge: P. J. Lord*

324 *Interiors: Offices at Bedford Square, W.C.1: Architect, Trevor Dannatt*

325 Design Review

327 *Here and There* by Gordon Cullen When, by building, we create an interior space, we leave the surrounding volumes of space unmodulated; but when we group several buildings together, we create exterior spaces of which human beings can take possession as much as they do of interior ones. And in doing so we create relationships of spaces, between interior and exterior, between one exterior space and another, between the space that we occupy, here, and the one we perceive outside, there. In this article Gordon Cullen illustrates, by word and sketch, the kinds of here/there relationships at the town-designer's disposal.

331 Current Architecture

Miscellany

335 Books

337 Exhibitions

338 World

340 Counter Attack

341 Townscape

Skill

343 *Metal Finishes* by John Sharp Metals remain almost unknown materials for the architect, particularly in their visual aspects, yet the vast variety of finishes—rough, smooth, natural, coloured, coated, pickled, and so forth—are clearly of crucial importance in an architecture where metals form an ever larger part of the visible surfaces. In this article John Sharp gives a brief dictionary of the finishing processes in current use, and their characteristics, visually and mechanically.

348 The Industry

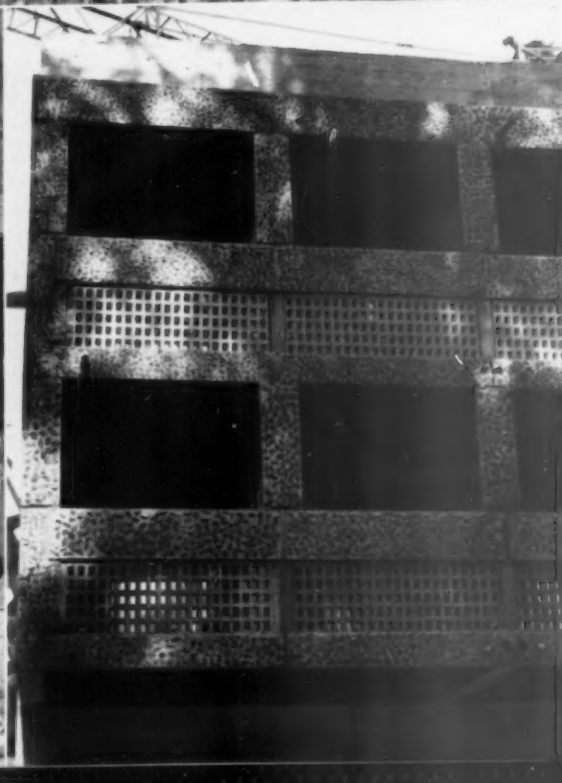
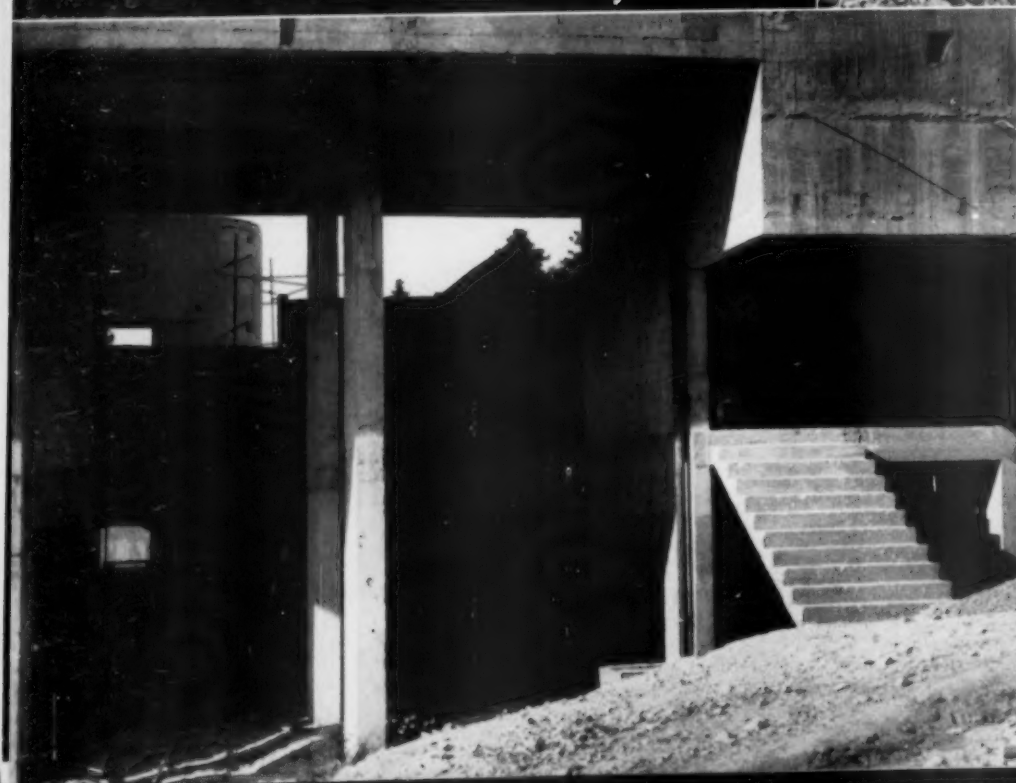
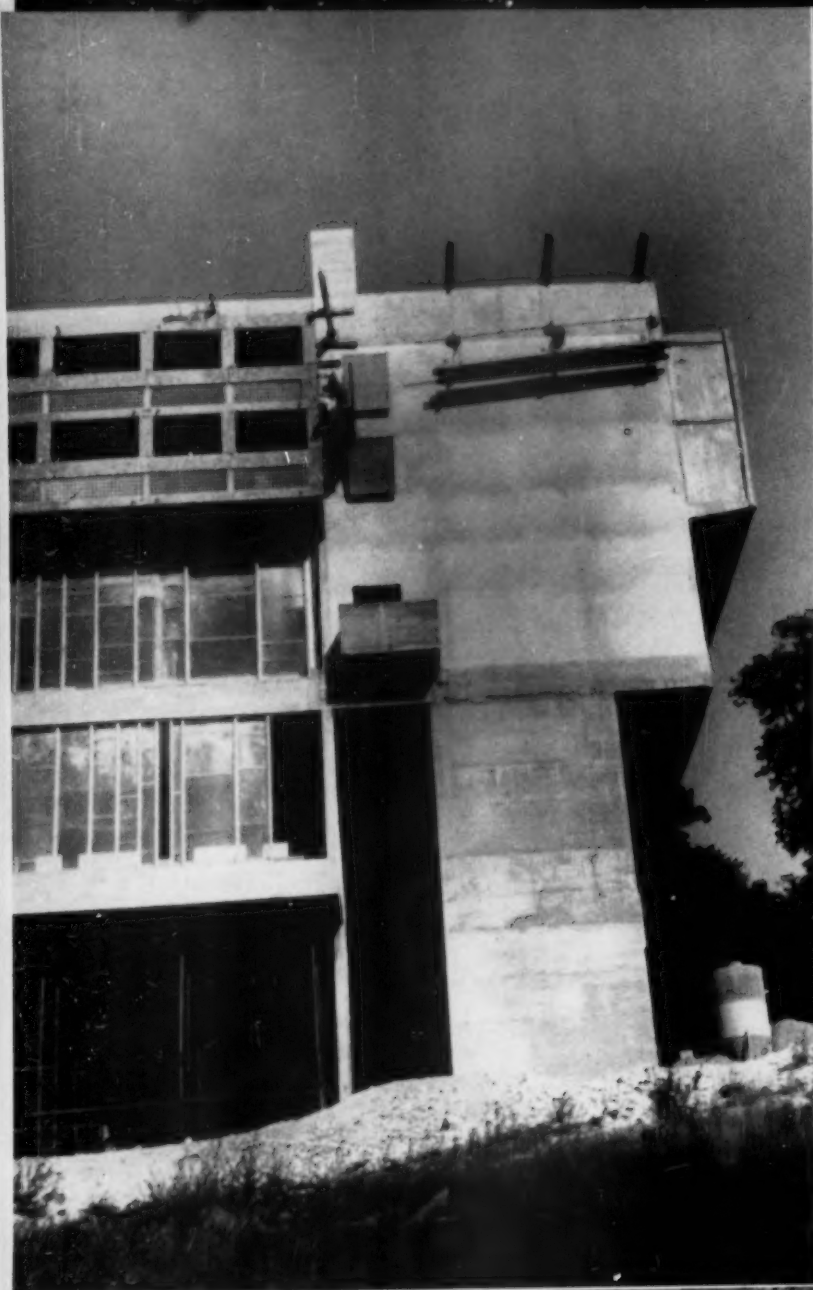
352 Contractors


Author: Georgina Masson. Born in India in 1912, before the war travelled in Egypt, Morocco, and China, worked as a free lance journalist in Singapore. 1941-43 Ministry of Information; 1943-47 was employed by the Foreign Office in Algeria, Egypt, and Italy. Since then, with the exception of a year travelling in the Congo, has been resident in Rome as correspondent of the Educational Supplement of *The Times* and of the ARCHITECTURAL REVIEW, is a frequent contributor to *The Times* on Italian subjects. Her life of Frederick II of Hohenstaufen was published by Secker and Warburg last year (reviewed in page 336), and a book on Italian Palaces and Villas will shortly be published by Thames and Hudson.

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FIVE SHILLINGS



Now nearing completion on a hill outside Lyons is Le Corbusier's second major religious building, the monastery of La Tourette. The general plan and siting are discussed on p. 389, and the details opposite  serve to draw attention to the richness of the parts—the use of slabs and columns structurally, and curved canted legs, bottom left, to brace the building against the fall of the site, and the most striking usage of all, the contrast of the rough-textured balcony structures, below right, with the glass and irregularly spaced vertical slats of what Le Corbusier calls a 'pan de verre ondulatoire.'

Georgina Masson

ITALIA NOSTRA

CAMPAIGN TO DEFEND THE ITALIAN SCENE

The problem of outrage is in many respects more acute in Italy than in England; partly owing to 21 years of fascist dictatorship and Latin individualism, public opinion has less coherence and force and, except for a few isolated cases, there are few independent voluntary organizations who interest themselves in the preservation of landscape and historic monuments—nothing comparable to the National Trust exists. As a result private speculative interests and political pressures have more power, and in the existing state of the laws a conscientious private owner of an historic monument is actually penalized by having to pay heavier taxes if he keeps it in good condition than if he lets it fall into ruin.

It was to fight this state of affairs that some three years ago Senator Zanotti Bianco, Prince Aldobrandini, Prince Caracciolo, Professor Bassani, Signora Craveri Croce, the Hon. Hubert Howard, Donna Desideria Pasolini, Signor Magnani-Rocca and Professor Trompeo founded Italia Nostra, an 'association for the protection of the national artistic and natural heritage.' Even in its initial stages the formation of the association was welcomed by the Italian press, and within six months it had enrolled a thousand members; today, as well as the head office in Rome, it has branches in Bari, Cremona, Florence, Milan, Naples, Palermo, Salerno, Verona and Venice. Although the association's terms of reference are purely concerned with the preservation of historic monuments and the countryside, it is interesting to note that by a process of natural evolution it has inevitably been led to take a leading interest in planning, or

rather the lack of it, that exists in Italy today, and its directive committee now includes architects such as Gio Ponti and Ignazio Gardella as well as Roberto Pane and other well-known art historians.

One of the first aims of Italia Nostra has been to awaken the public conscience and interest in the problem, by means of meetings and conferences, and to this the Italian press has made a notable response—from well-known papers such as the *Stampa*, *Corriere della Sera*, *Giornale d'Italia* and *Messaggero*, right down to the smallest provincial publications. The association's own two-monthly review, *Italia Nostra*, carries a summary of these articles that make depressing reading, but shows that the press is only too willing to co-operate when provided with factual information. This last is provided in a regular feature in *Italia Nostra* that is very similar to the Counter Attack Bureau bulletin of THE ARCHITECTURAL REVIEW, to which it is encouraging to observe that the general public is now beginning to make contributions. An interesting example of this was a letter from a school teacher of Pojana on the deplorable condition of Palladio's Villa Pojana,¹ which is now used as a storehouse for Coca Cola!

The second aim of the association is to assist the responsible authorities and private owners in enforcing existing laws for the protection of the national heritage and to promote new legislation towards the same end. This is particularly necessary in Italy as the technique of the *fait accompli* is even more dis-

¹ See author's letter in AR, January, 1958, and her article on Palladian Villas, AR, July, 1955.

tressingly familiar than in England and the arrogance of vandals in using political pressure to achieve their ends, even in the face of a direct veto by the Soprintendenza of the Belle Arti, is probably unequalled. A particularly shocking example of this occurred in Vicenza last year when, in spite of direct orders to the contrary by the Belle Arti, the Palazzetto Paulon, which forms part of the Piazza dei Signori and Piazza Biade that surround Palladio's Basilica, was pulled down.

Profiting from this bitter experience at Vicenza, Italia Nostra called a public meeting in Cremona last December to debate the proposal for even more far-reaching destruction in the old city centre of Cremona, which would have altered its character and function. As a result of the meeting not only was the destruction avoided by the intended buildings now being erected on another site, but the whole question of the preservation not only of scheduled historic monuments but also of their setting, especially of historic piazzas 'with their human and artistic functions' was fairly and squarely posed for the first time.

This is a notable step forward in the Italian conception of planning, for as Kidder Smith pointed out in *Italy Builds* 'not only is there no central authority, there are no qualified planners as such. There are to be sure plenty of "plans," but precious little planning.' In cities such as Cremona the existing plans are usually those drawn up during the fascist period, with their familiar and outmoded conception of 'planning' to relieve traffic congestion by driving wide thoroughfares through the heart of an old city to 'open it up,' creating large blocks of modern buildings that, with their increased office and living accommodation, render the traffic problem even more serious than before and at the same time entirely destroying the character of the city and the setting of the scheduled historic monuments, leaving them high and dry in a townscape to which they bear no relation whatsoever.

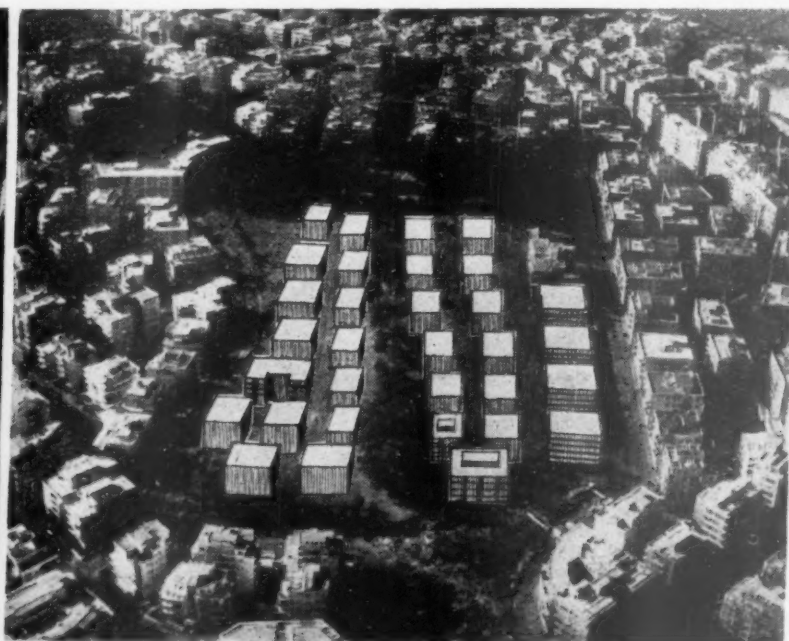
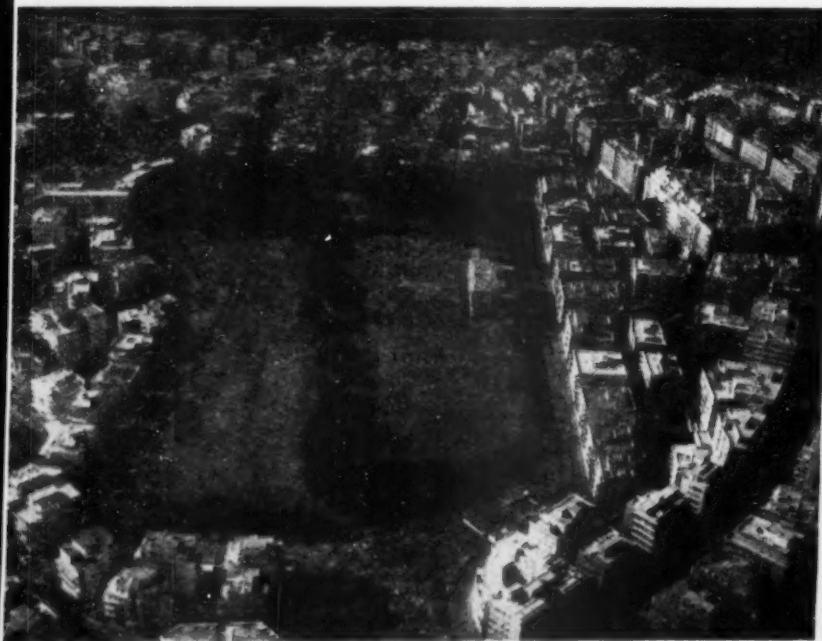
Italia Nostra carried this concept of plan-

ning on an overall scale a step further by calling a conference in Venice last month to discuss what measures could be taken to preserve the special character of the Venetian province, towns and countryside alike. It was of particular interest as not only was it the first conference of its kind to be held in Italy, which may serve as a pattern for other provinces, but also because the preservation of the Venetian Villas, the most important topographical monument of its kind in Italy, came under consideration.

The action already taken by the association in support of the Amici dei Monumenti of Vicenza for the salvation of the Venetian Villas provides an excellent illustration of what can be achieved in promoting legislation for the preservation of historic monuments. It was largely as a result of their representations and of projects put forward by them that a bill for the preservation of the villas was submitted to a committee of the Senate in 1955 and presented to Parliament by the Minister of Public Instruction in November last year with an increased financial allocation. Although this has not yet received final parliamentary sanction owing to the general elections, it is hoped that it will do so during the next parliamentary session.

The bill provides for the creation of an Ente (public body) for the preservation of the villas, with a state grant of two thousand million lire over a period of ten years and an annual contribution of 45 million lire a year from the local tourist organizations and municipal administrations of the towns of the Venetian province. It will also give the Ente wide legal powers for the expropriation and purchase of villas that could not otherwise be saved. If it is properly implemented the bill thus provides the basis for the restoration of many villas that would be otherwise doomed, but, given their vast number² and the enormous size of some of them, even the substantial sums provided by the bill will not guarantee their

² The catalogue of them issued at the time of the Venetian Villa exhibition at the RIBA took up 844 pages of print.



1, the gardens of the Villa Chigi in Rome as they were and, 2, as they probably will be, if present schemes for development are allowed to go through.



3, two buildings at Bergamo which are to be demolished and replaced by others which will radically alter the silhouette of the hill.

upkeep. It is to be hoped, therefore, that the Venice conference may give practical form to some of the projects already mooted by Italia Nostra with this end in view, for instance—of pressing for tax exemption for parks and gardens attached to the villas and for a certain proportion of agricultural land attached to them, if this still exists, whose income will be set aside for their maintenance, provided they are open to the public; also the conversion of those that are conveniently situated into hotels and residential study centres for students of architecture and art history, in collaboration with Italian and foreign learned bodies and foundations, charging only a nominal rent in return for their upkeep.

Italia Nostra also collects funds for the restoration of monuments and art treasures, and in its three years of existence has already been responsible for restoration of Rosso Fiorentino's frescoes in the Santissima Annunziata and Ligozzi's frescoes in the Church of Ognissanti in Florence, for the restoration of the Palladian church of S. Maria Nova at Vicenza, restoration has also been begun on the church of Sant Angelo in Formis in Campania and funds have been collected for the restoration of the eighth-century churches of Tuscania,.

These are some of the results that Italia Nostra has already achieved during the last three years, but in order to understand what it is up against in the way of vested interests, ignorance, and individualism—especially the latter—one cannot do better than to quote the opinion of an impartial foreign observer upon the worst aspects of urban development in Italy today, which Kidder Smith described as 'An individual selfishness and total disregard for the whole is characteristic of virtually every new suburb in Italy today. . . . The new subdivisions of Italy are a godless, soulless series of residential slums, devouring the countryside as they advance upon the nature about them. They are a disgrace to the country, its planners, its architects and its people' and to compare it with his description of the traditional centres of Italian life—the piazzas—'they hold inspiration for us today . . . because their study will enable us to make finer shopping centres, more agreeable urban cores and develop a keener understanding of psychological and physical factors that go into making the space solutions that we call architecture and town planning.' Italia Nostra has been founded to prevent the destruction of just these aspects of Italian cities, and it is to be hoped that it will enjoy a long and tenacious life:

BUILDINGS IN LAGOS

ARCHITECTS

ARCHITECTS OO-PARTNERSHIP

below, plans of typical pair of houses.
1. facing page, the windward side of the house has sun shading screens of white painted hardwood louvres fixed to black painted steel tubes which also support the balconies.

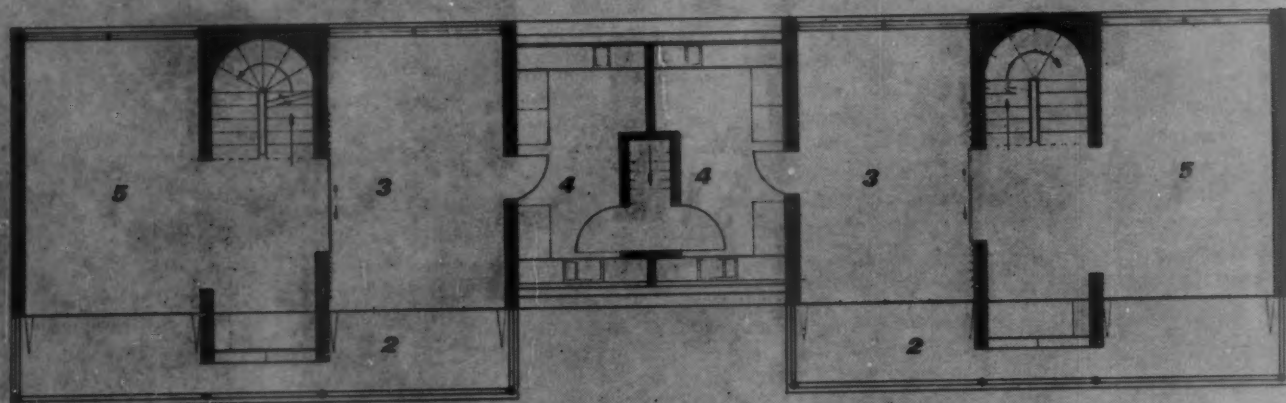
HOUSING FOR THE NIGERIAN PORTS AUTHORITY

Key

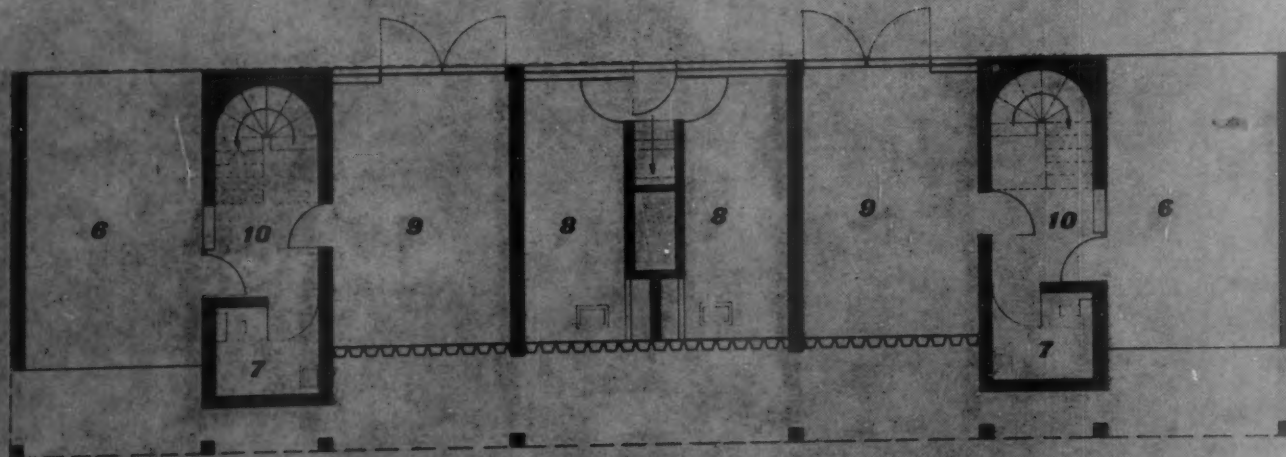
- 1. bedroom.
- 2. balcony.
- 3. dining room.
- 4. kitchen.
- 5. living room.
- 6. car port.
- 7. cloakroom.
- 8. washroom.
- 9. garage.
- 10. hall.



Second floor



First floor



Ground floor

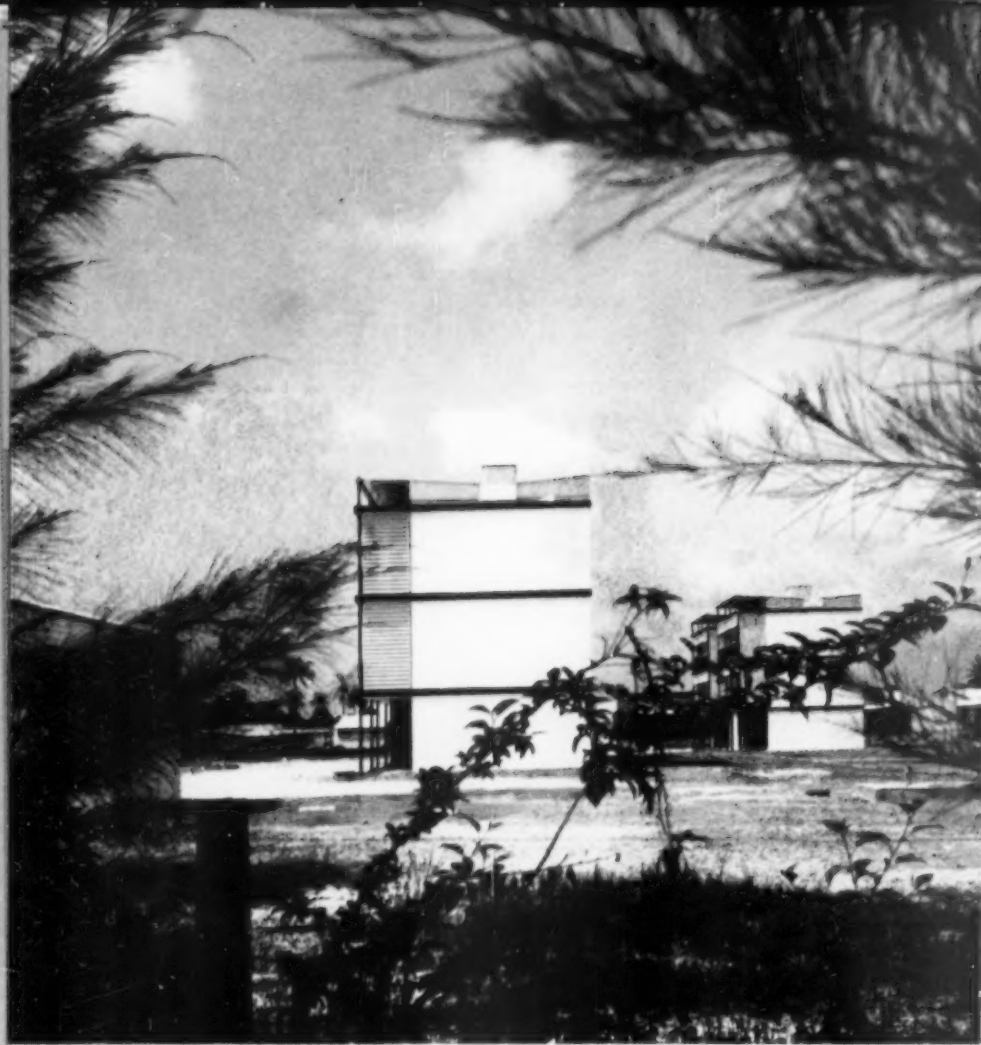
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The Nigerian Ports Authority commissioned these houses for their senior staff and, in the hot humid area of southern Nigeria, the main requirements were good cross ventilation and shading from direct sunlight and glare. The living area is on the first floor, to benefit from any breeze in areas of thick bush. The construction is of 9 in. cement-and-sand hollow blocks rendered inside and out, with reinforced concrete floors finished in terrazzo and

cork tiles. The butterfly type roof of troughed aluminium sheeting has two membranes, with cross ventilation between. Bedroom ceilings are finished in mahogany boarding fixed to the underside of the timber roof trusses, with aluminium foil above. Infill panels on the windward side are in hardwood, on the lee side projected window gearing is used for opening timber panels in the bedrooms and living rooms.



HOUSING FOR THE NIGERIAN PORTS AUTHORITY



2. distant view, showing the butterfly type double roof.

3. a pair of houses from the south-west.

4. on the lee side solid panels are opened by window gearing.

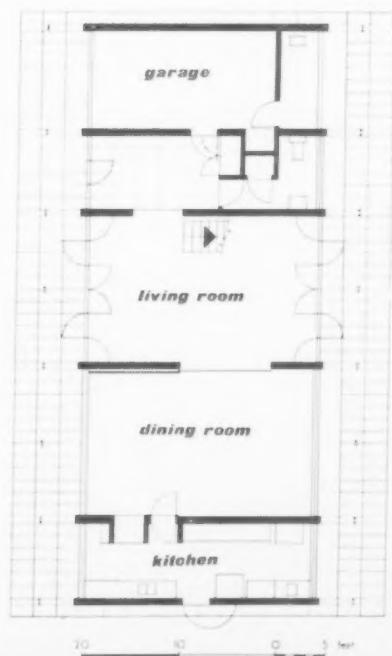
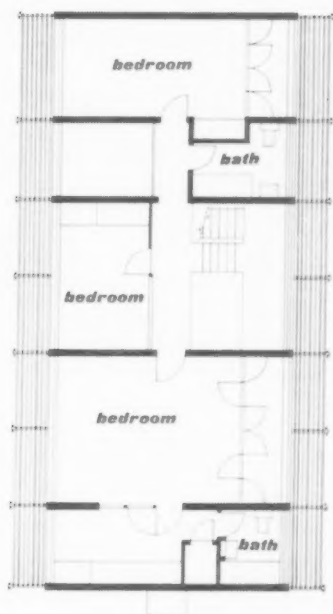
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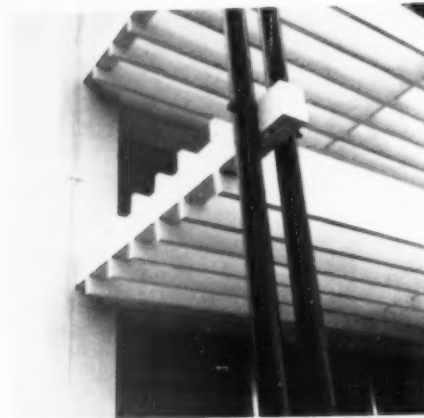
HOUSING FOR ESSO WEST AFRICA

5, steel columns support the projecting roof and also the timber anti-glare and sun louvres.



HOUSING FOR ESSO WEST AFRICA

6, the front of the house has glazed sliding doors to the living room and first floor balcony, other rooms have adjustable louvres with polished asbestos blades.
7, detail of the junction of sun louvres and steel column.



7

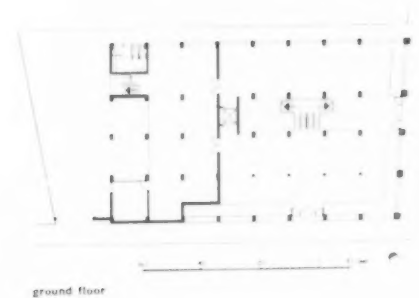


6

These houses are being built both in Lagos and Port Harcourt for senior members of Esso staff. The sites are open, with a constant breeze, and the main living accommodation is therefore at ground level, while two of the three bedrooms are air-conditioned. The houses are one room deep, with cross walls of 9 in. cement-and-sand-blocks supporting a reinforced concrete first floor slab. Floors are finished in terrazzo, cork and ceramic mosaic tiles.

STORE IN LAGOS

An Indian firm required a two-storey building in Lagos to sell a wide variety of goods ranging from fish to clothing and cosmetics, and complete flexibility was needed in the location of departments. The building was designed in two stages, of which the first is illustrated; the second stage will provide an additional three stories. There is a mezzanine to both ground and first floors, providing a view of the entire sales area. The construction is on an r.c. frame with hollow pot floors and 9 in. cement-and-sand block infill panels, rendered and painted. The ground floor display windows are plate glass in mahogany frames; on the first floor centre pivoted solid screens give ventilation and shade; additional ventilation is provided by ceiling fans. The flooring is of precast terrazzo tiles.



ground floor

STORE IN LAGOS

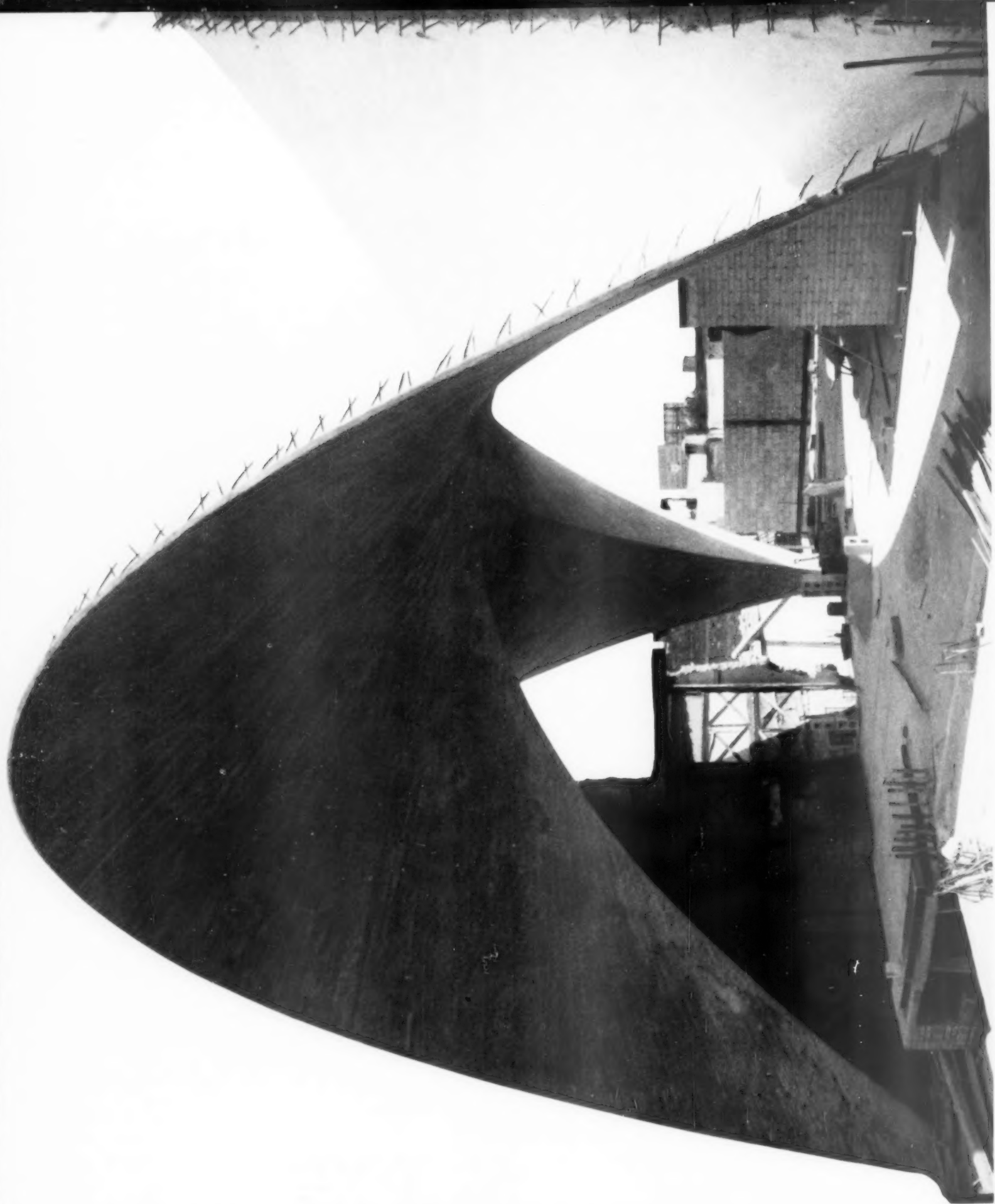
- 8. general view of the first stage: the present roof is temporary.
- 9. solid centre-pivoted screens provide ventilation to the first floor; glare is reduced by the horizontal louvres of painted hardwood.




8



9



If any single structural form may be taken to symbolize or summarize the new excitements of engineering, it is the hyperbolic paraboloid, represented opposite  by the crossed vaults of San Antonio de la Huertas church, 1, a work of one of the major figures to emerge from the excitement, Felix Candela, the Spanish-Mexican engineer. The precise relationship of engineers like Candela to the world of architecture is the main theme of Mr. Boyd's article which begins below.

Robin Boyd

ENGINEERING of EXCITEMENT

The plain but wholesome dough of modern architecture is being flavoured with more and more currants: buildings with warps, waves, folds, droops and other unexpected shapes sharply outlined against the modular grid background. They are the shapes seen on graphs, on stress diagrams over an engineer's shoulder, and each gives a visual indication of a special structural principle. At the least they are helping to relax the stilted language of modern architecture. At the most it might be thought that they are tending to turn the movement back through a hundred years to start again following more closely to the track suggested by the Crystal Palace and the *Galleries des Machines*. But in fact they are on another track.

Despite their apparent diversity these buildings have in common that every one of them can be, and frequently is, called 'exciting'. But their principal motive was not to attract attention. This is the case only in a sub-strata named Googie, after the remarkable Californian restaurant chain. The Googie style makes shapes for sake of shocking, and everyone in the know can easily distinguish the type—even if it must be admitted that those in the know include few enough people outside the professions of architecture and engineering. The new-shape architecture is not simply providing solutions to structural-functional problems and it is certainly not done frivolously. It may mark the beginning of warmer collaboration between architecture and engineering, but it is not in the same dimension as the equally extraordinary shapes of unselfconscious engineering, as found in unquestionably practical machines, bridges, scaffolds, and so on. In shape architecture the vehicle may be structural but the initial thrust came from outside the engineer's office.

The shapes in themselves are not essentially new. They seldom introduce principles not understood many years ago. They seldom are more functional or economical than a cube. They sometimes demand elaborate methods—such as, in an extreme case, earth forming for a multi-curved concrete shell—which contradict technological and social develop-

ments. The new movement could have happened indeed at any time since the birth of modern architecture, but when it raised its hand earlier, as in Barcelona, it received no encouragement. It is growing now for various reasons unassociated with engineering but connected with the urge of the second generation of modern architects to find something new to say. This urge, perhaps often subconscious, has infected many types of architects—technological, scientific and poetic—for reasons which first became apparent about the middle of the 1950 decade.

Until recently the main road of modern building technology appeared to be blocked temporarily by a glazed curtain wall, and all impatient explorative technologists became anxious to try anything for a chance to see what lay ahead. At the same time a phenomenon developed which may be called the science fetish. Many men drawn to the practice of architecture have a little in them of the gadgeteer and the inventor. Many at heart are little Leonardos in love with the idea that their calling can be the catalyst merging the incompatible natures of art and science. This modern world of specialists, however, is impatient with a man who thinks he has many parts. It selects the parts it likes best and gives him credit, but anything else he wishes to do is inclined to detract from rather than add to his prestige. This attitude seems infuriatingly stuffy to men with octopus talents and they try earnestly to excel in the opposite direction, especially to confound the dullard specialists. Thus (to select an external example) Charles Chaplin wants to be a social commentator, Le Corbusier (to return) wants to be acclaimed as a painter, Wright wants to be recognized as a master engineer, and the architect generally, who usually by nature, training and tradition believes himself to be equally proficient in two fields, wants greatly to gain more recognition for what his left hand can do in the sciences. In this nuclear age he is embarrassed still to be considered an artist. He would rather invent a structure than seek a spatial inspiration.

The third and most important factor contributing to the new motivation was a partial reaction, a pendulum swing against the idea of universality in modern architectural theory and a hankering after the particular, the individual poetic expression. The nickname 'International Style' may have been misleading, but certainly the methods of modern architecture have been international and universal. Each building has been expected to exemplify some theory capable of universal application—no matter how much adaptation within the theory might be necessary to suit regional variations from the tropics to the poles. Thus conventional modern theory shudders when faced with many of the exciting-shape buildings, not because they are necessarily less logical structurally or functionally, but because they are conspicuously once-only creations. They are, in short, poetic buildings.

If it does nothing else, this movement at least has had already the salutary effect of reviving spirited criticism of individual works and a more searching examination of the present position of architecture.

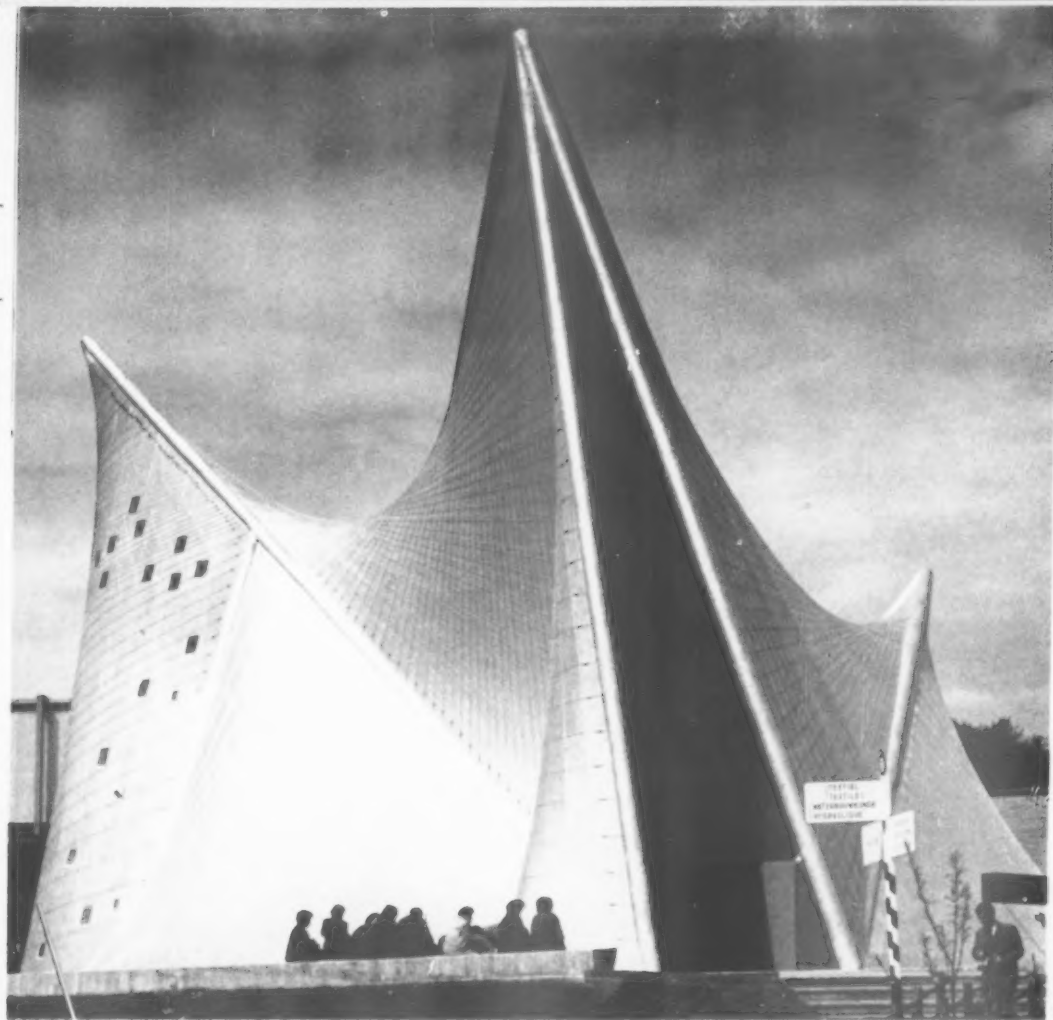
'Today structural ideas are invaded by extravagance, and they are deprived of all justification' said Luigi Nervi in condemnation of the structural illogic of the MIT auditorium's dome. 'Who would be so rude and demand a view of the exterior of a Nervi hall?' asked Sybil Moholy-Nagy in contempt for unmitigated technique. And many less renowned critics and numerous ordinary architects have fallen into utter confusion to have the simple peace following the curtain-wall crusade shattered by this new unnerving excitement. The curves seem to point round a corner in architectural development. They are exciting; but are they valid, rational, genuine? How can they and the glass box both be right? No one answers these questions convincingly. Surveying the MIT auditorium and his mixed-up confreres of the post-war decade Eugenio Montuori said in 1955: 'The mess is complete.'

Perhaps it all began with Borromini, perhaps with Gaudí, Mendelsohn, Maillart or Nervi; but the sparse contributory elements rapidly converged into a movement in a matter of months between 1953 and 1955. During this time a number of respected men made notable assaults on the rectangle: among others, Le Corbusier at Ronchamp, Saarinen at MIT, and Matthew Novicki at Raleigh, 13. This last-named little town in North Carolina, USA, is really the nursery of the non-rectilinear rage. Novicki's saddle-

[cont. on page 305]



2, covered market in Algiers; the thin-shell vault by Enrique Torroja is one of the earliest of its kind.



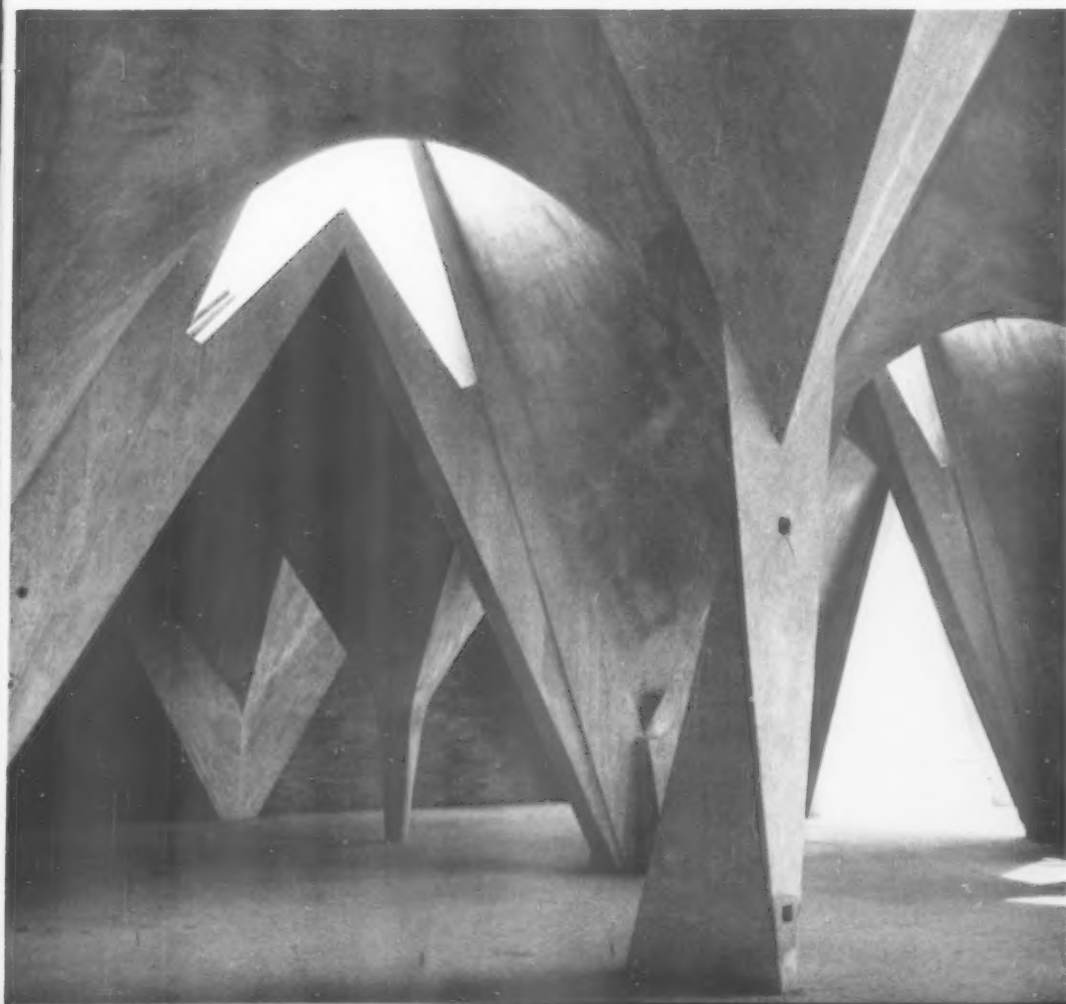
In spite of manifest differences of approach, particularly in plan, there are striking resemblances between the formal and structural solutions employed by the designers of the Philips Pavilion at the Brussels Exhibition and the church of the Virgen Milagrosa, near Mexico City.

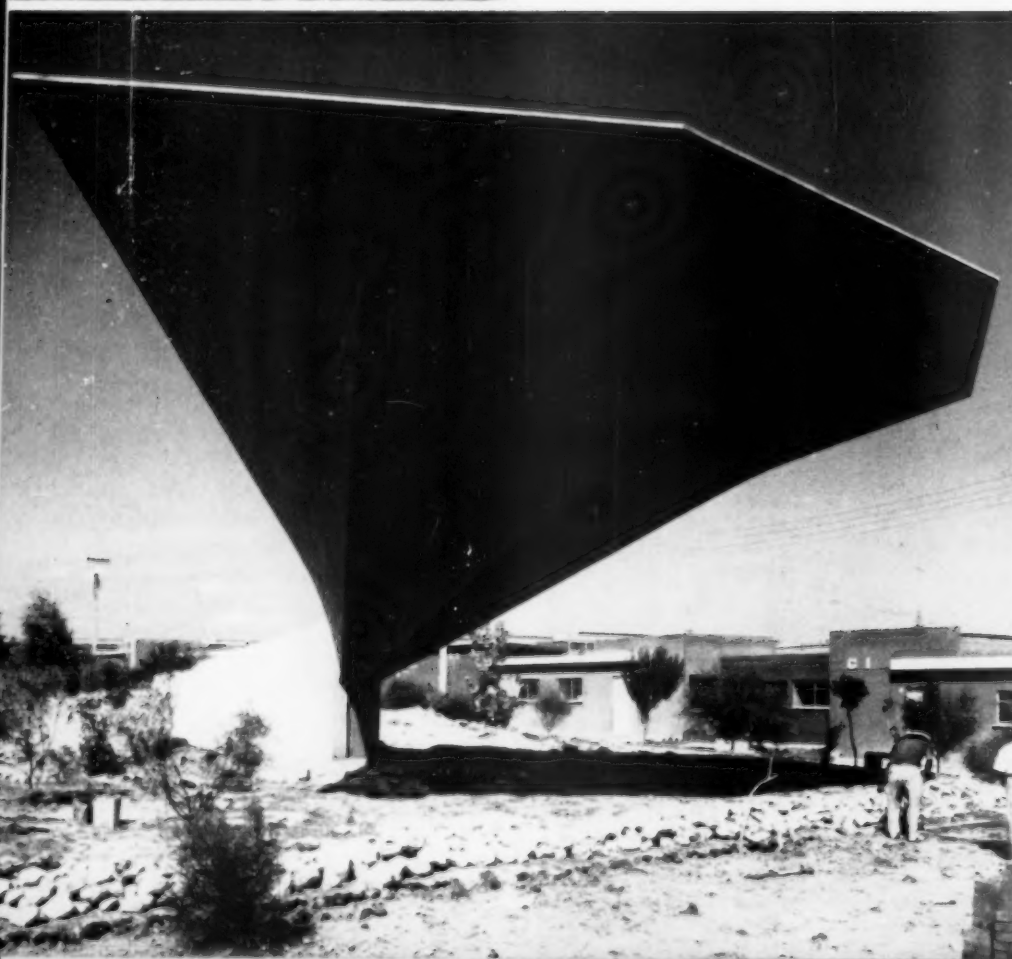
3, the Philips Pavilion, architect Le Corbusier, engineer H. C. Dagster, though laid out on an irregular plan of interlocking saucers of wall-roof, nevertheless reveals the inherent and internal order of the hyperbolic paraboloid form in the pattern of straight generating lines that can be seen on its outer surfaces—a manifestation of elementary geometrical logic that refutes those who call these designs irrational.

4, the Virgen Milagrosa is a church of fairly conventional plan, with a main nave and lateral chapels,



visible on the exterior, 5, but the effect inside is, at first sight, far from regular or customary. Designed by Enrique de la Mora and Felix Candela, it gives more dramatically visible form than any other comparable structure to the concept of a warped slab. It has been compared to the work of Antoni Gaudí and, with equal propriety, to early cubist paintings by Picasso—a remarkable tribute to the way in which a spectacular technical achievement (the slabs are only 1½ in. thick) has been subordinated to an aesthetic or architectural end.





The name of Felix Candela is particularly associated with the use of warped slabs of rectangular plan, or formed of simple straight-sided elements, usually of minimal thickness and equally small vault-depth.

6 and 7, show single cantilevering vaults by Candela, both of them taken back to a single support: the entrance canopy to the Lederle Laboratories, Mexico City, carried on V-legs with a back-stay, and an acoustic hand-stand shell, consisting, in effect, of three 'Lederle' vaults grouped fan-



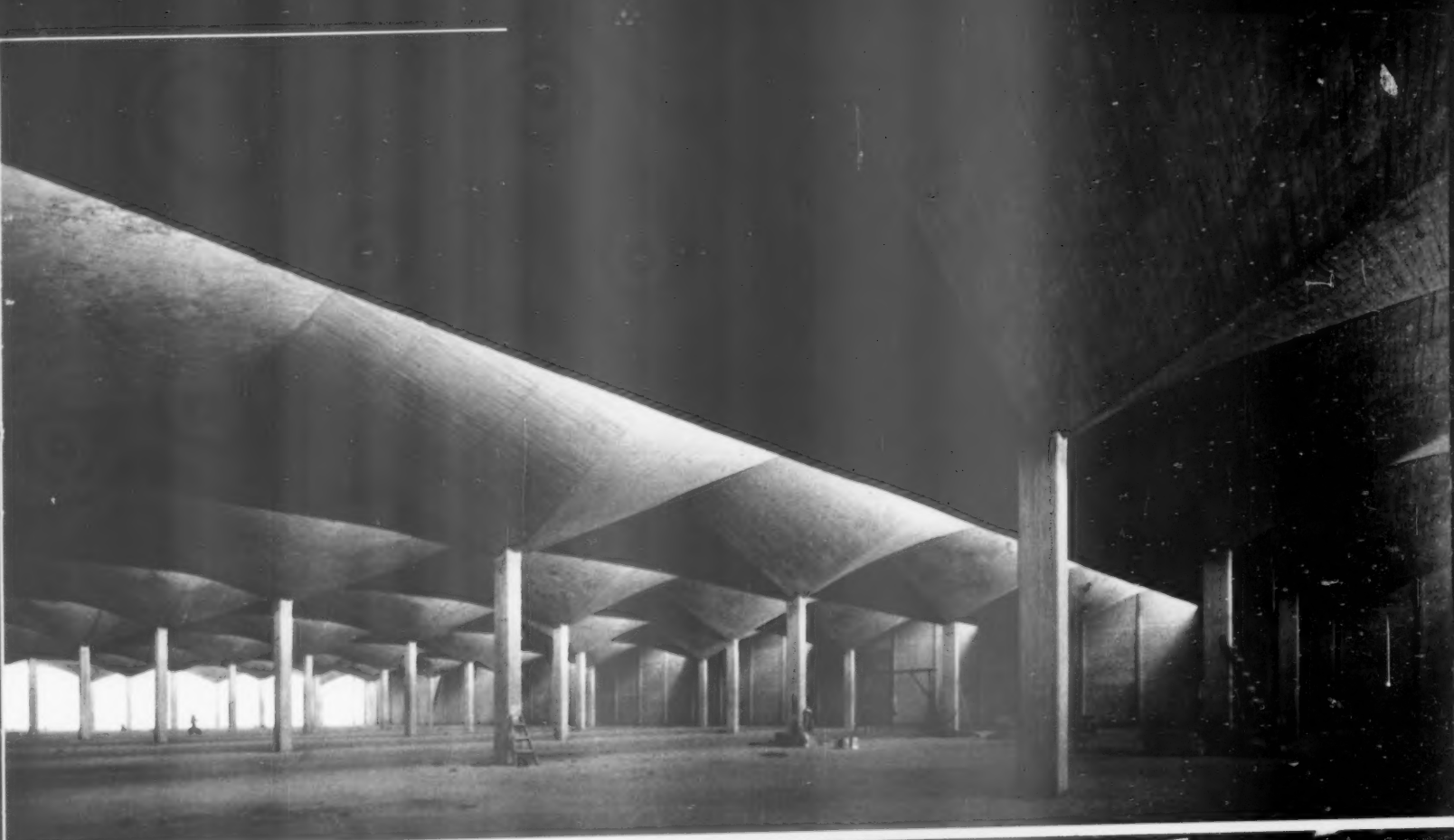
wise and sprung from a massive counterweight slab.

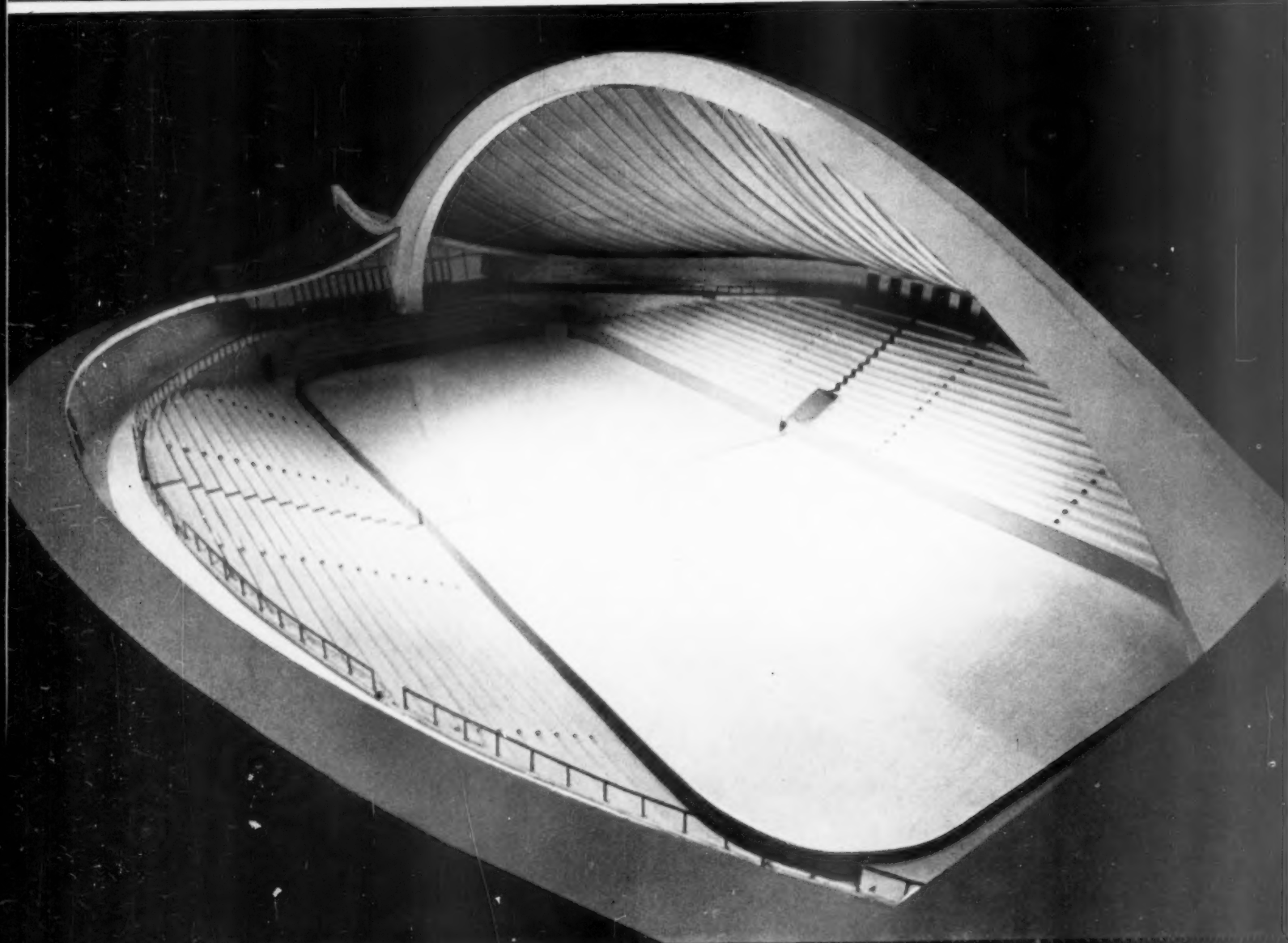
8, however, mastery of the square hyperbolic paraboloid is not Candela's alone; this weaving-shed for the Wilton carpet-factory was designed by Robert Townsend in consultation with the Timber Development Association—because of their generation from straight members, forms such as these lend themselves to realization in wood (and indeed, such a form must be built in wood to form the shuttering for even the most sophisticated concrete shells).

9 and 10, the outstanding advantage of Candela's square vaults is that they can be assembled, like any other modular covering, to shelter areas of any size. In the industrial applications to which it lends itself so well, this vaulting technique usually involves tilting the shells through about ten degrees in order to create north-lights, as in the Cabero warehouse, 9, near Mexico City. In the 'High-life' garment factory, 10, this north-lighting is supplemented by the provision of glass tiles distributed in linear patterns across the vaults.

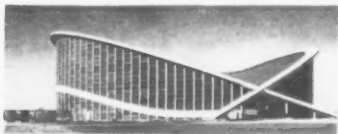
Saddle roofs, with opposed double curvatures whose shape is given by the attitudes taken up by loaded cables (even if they are not made of cables in structural fact) have achieved their finest flowering in North

9
10





America, where they made their first significant appearance in the great State Fair Arena at Raleigh, North Carolina, by Deitrick, Nowicki and Severud, 13. However, an important European example, notable for the simplicity of its supports, has been created to house the first transmitter of Radio-Television-Europe at Felsberg, 14, for which the architects



13

were Guédy and Nejavits-Mery, the engineers Freyssinet and Guyon.

11, a North American saddle-vault in Europe is the Congress Hall, in West Berlin by Hugh Stubbins, with Fred Severud again as engineer. This view shows better than most how the planning of the interior, with the rake of the auditorium floor along the minor axis of the vault, contradicts

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←
12



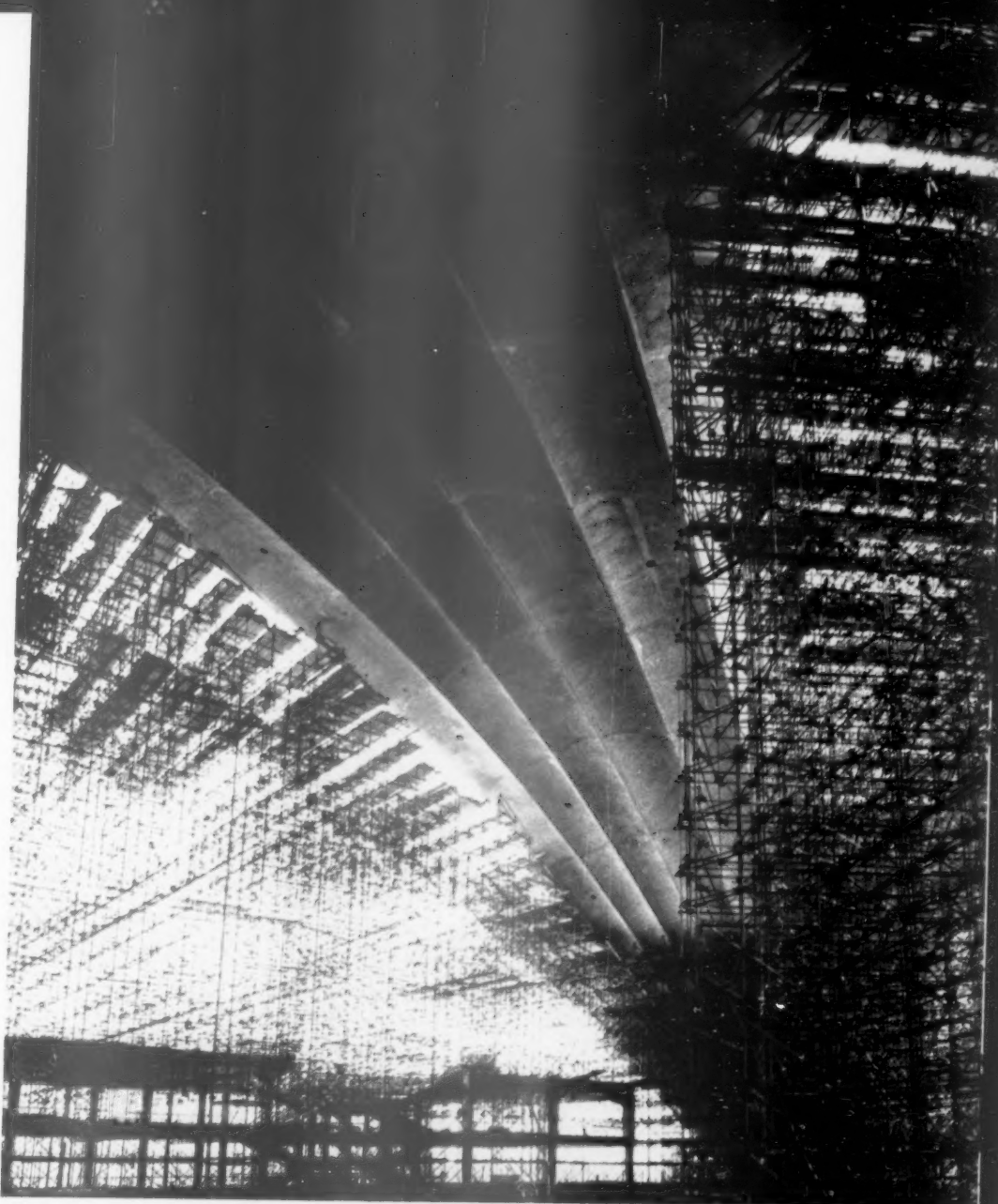
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the apparent directional dynamism of the total envelope.

12, Fred Severud was the engineer yet once more for Eero Saarinen's Yale Hockey Rink, now nearing completion. This model shows that there are effectively two asymmetrical saddle-vaults, slung between the ridge-beam which is a common support and the horizontal walls-cum-edge beams on either side.

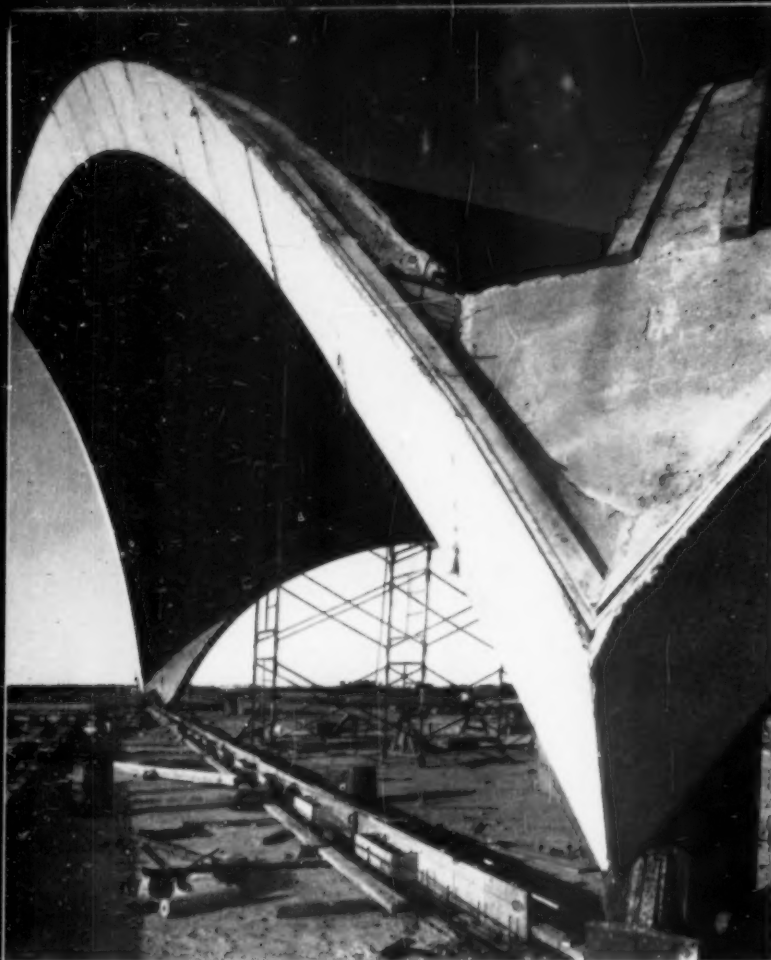
15 and 16, the largest and most recent work of Europe's greatest engineer-designer, Pierluigi Nervi, is the vast vault of the CNIT exhibition hall on the outskirts of Paris, on which he worked with Bernard Zehruss and Jean Prouvé. In spite of the great sophistication of methods and materials involved, it would not be altogether improper to regard these

16



15



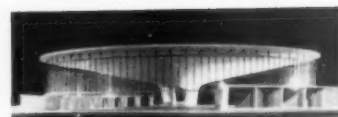


cylindrical shells of hollow concrete members as a gothic vault, resting on three supports instead of four.

Variations on the theme of shell concrete construction:—

17 and 18, airports—Yamasaki's at St. Louis shown in course of erection, and Pani and De la Mora's at Acapulco completed.

19 and 20, markets—the corrugated dome of Simon and Morisseau's at Royan and Michel Andrault's at



20

Sceaux, the main mushroom being a hyperboloid of rotation.

21 and 22, a priory—a circular collegiate church at St. Louis, the main shell folded to give twenty peripheral chapels, designed by Hel-

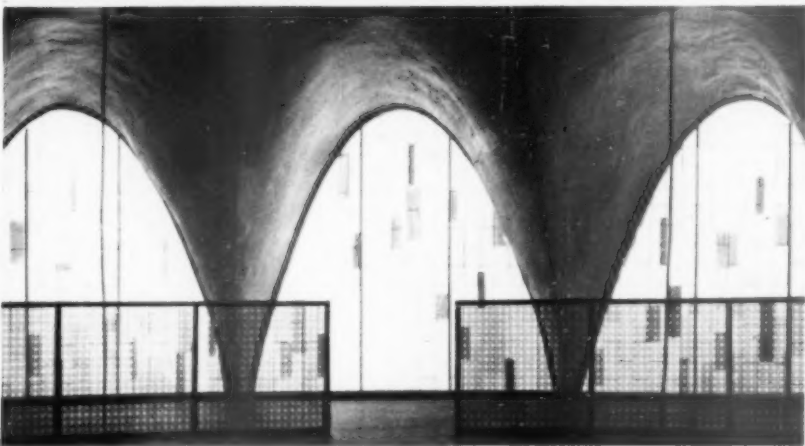
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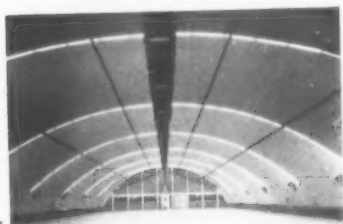
Consecutive runs of cylindrical vaults constitute a form of covering that has been little exploited in spite of their advantages for simple construction and their visual attractions.

23, Max Borge's Tropicana night-club in Cuba, completed nearly six years ago, was a pioneer use of consecutive cylinders, here arranged in diminishing sizes of which the last and smallest serves as an acoustic shell for the bandstand and stage. The axes of the cylinders are not colinear, but joggled over so that the right-hand edges of the shells (as they appear in this view) are more or less in line.



23

24, 25 and 26, in accordance with a good old tradition of modern architecture this purely functional application of consecutive cylinders is more spectacular than even the night-club—a northlit factory-hall at Gosau in Switzerland by Danzeisen and Foser, engineer Heinz Hossdorf. The



24

spaces between the crest of one vault and the low tail of the next are occupied not only by glazing but also by an open truss that connects and stiffens the two vaults.



25

26





27, one of the most widely discussed of all pieces of exciting engineering and one most clearly conceived as a foil to repetitive grid facades is the conference hall of the UNESCO building in Paris, architects Breuer and Zehruss, engineer Pierluigi Nervi. It is conceived in a form that once looked as if it might be even more ubiquitous than the hyperbolic paraboloid—that is, the true folded slab, folded like a Klind lampshade, though here it is diversified by the

ceiling membrane proper which, as can be seen, rises at one point to the crest of the folds, in a gentle acoustic curve.

28, still a folded slab, but here sophisticated and curved till it looks like the crinkled skin of a melon, the 400-foot clear-span auditorium for the University of Illinois, has been projected by Harrison and Abramowitz, with Ammann and Whitney as engineers. The lower part is

also a folded slab shell, though of simpler form, and the upper and lower halves are joined at their rims by a tension ring common to both. Formwork, never simple for work of this kind, and rendered more complicated here by both the size and the pattern of the folds, will be made somewhat simpler by casting the upper shell in forty-eight segments (in batches of four) on a re-usable shuttering rotating around a central tower.

27
28



29, double sequence of high and low hyperbolic vaults projected by Felix Candela.

cont. from page 296]

roofed, circular cattle judging pavilion and Eduardo Catalano's warped-roof house in a suburban street nearby started the race which by late 1956 had littered the draughting rooms of every architectural school in the western world with cut-outs of twisted and folded cardboard. Hugh Stubbins took the Novicki structure as the starting point of his Berlin Congress Hall. Catalano demonstrated at MIT how the hyperbolic paraboloid could be repeated indefinitely to extend the theme. By 1956 multiple-unit roofs commanded the avant-garde. At Long Beach, California, Raymond and Rado connected three hyperbolic-paraboloids for a restaurant. In Mexico, Felix Candela linked some hundreds of high concrete shells to make the roof of a great market like a plump, buttoned railway carriage seat, 29. In Poland, where the architectural iron curtain is thinnest, Sikorski interlocked scores of tilted vaults for a factory roof. For Sydney Opera House, 31, Jørn Utzon grouped a number of shells of different elevation to billow like sails at the edge of the harbour. Meanwhile steel, and even wood, were straining to meet the challenge. Steel was put into tension in all manner of ways not previously exploited, but somehow it was seldom quite so exciting as concrete. In cable form it curved satisfactorily, but in compression steel and wood are too matter of fact for the new movement. No matter how eccentrically the points of the structure are placed, these rigid materials remain stubbornly true to the straight lines between them.

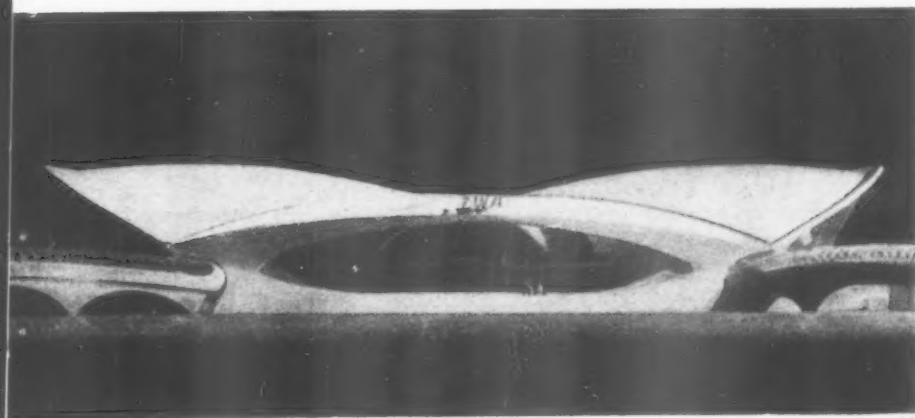
Most of the exciting buildings are single-storey, and in many the shape is confined to a roof resting on a structure and a plan of conventional bearing. These are the tentative, transitional members of the movement. Their roofs are separate elements and as such cannot be considered as much more worthy than any applied decoration. They answer the call for more interesting things overhead, out of the functional way, which Giedion made in *Space, Time and Architecture*, although he undoubtedly expected more

integrated results. If they constituted the entire movement, it would deserve no more study than the levitation phase: a pleasant interlude with some valuable lessons in the residue. But they are not all, and there are new irregular buildings which demand our most careful consideration. These are those in which the theme shape makes up virtually the entire shelter. The plan, the traffic flow, all the functional accents reflect the curves or the odd angles of the structure. The spaces between shells or trusses perhaps are filled with glass or sympathetically twisted concrete supports, but in models and drawings at least the adjuncts offer no interruption to the dominant structural form. But even in these buildings an anomaly becomes apparent before construction is finished.

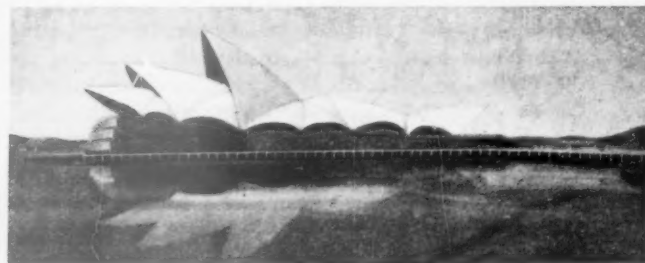
This anomaly is inherent in all buildings of unusual shape, angular or curved; for what freedom the modern age has given architects with one hand it has taken away with the other. The advanced engineering techniques which make possible on the one side the excitement, the flights of fancy, the daring architectural expression, on the other side insist continually on more conformity by the architect to the standardized machined ingredients. The more energetic the structural gymnastics, the more obvious the conflict is likely to be, for only the structure has been freed. More and more accessories are becoming almost as essential as the structure—lifts, lavatories, air-conditioning equipment, glazing members and so on, not to mention sandwich panel walls—and all these normally are strictly rectilinear. In the plans for Saarinen's TWA terminal building at Idlewild, one of the most fluid designs in the movement, 'like a giant bird in flight,'¹ there appear to be almost as many awkward corners and secret pockets, where the flowing shapes conflict with rectangular services, as there are in a Googie restaurant or a hexagonal Wrightian bathroom. 'Architecture is only worth doing if you can make all one thing of a building,' said Saarinen, à-propos of this building, 'so that

¹ The Architectural Forum, January, 1958.

30 and 31, tilted shells disposed symmetrically in the projected TWA terminal at Idlewild, by Saarinen and Associates; asymmetrically in Jørn Utzon's prize-winning entry for the Sydney Opera House competition.



30 31



every detail dovetails with every other detail and supports the whole.' Yet there is no dovetailing—and economically can be no dovetailing—between his curved concrete and, for instance, the elevator shaft.

One way to achieve the desired effect would be to discard all the advantages and economies developed through mass-production of building elements, and to have the equipment custom-built in bird-like shapes. The other way would be to encourage many more buildings to look like giant birds in flight and to persuade the manufacturers of equipment to mass-produce bird-shaped pieces at the same price as their normal rectilinear merchandise. But this would remove the justification for the structural and sculptural gymnastics: that they produce a unique, special architectural quality in answer to a specific problem. The more that an irregular non-rectilinear building approaches the condition of being 'a whole thing,' the less it can take one of the main advantages of being made in the middle of the twentieth century and dip into the larder of mass-produced equipment.



32, Notre Dame du Haut, at Ronchamp, by Le Corbusier: the most influential contribution by an acknowledged master to non-rectangular design.

Le Corbusier was able to keep his chapel at Ronchamp almost a whole thing because it had no equipment and only one straight wooden staircase at the back to shatter the fluid harmony. The exciting buildings are in fact most significant because

they are not expressions of mass-production techniques. They are anti-universal. They remind architecture that all the technical potentialities of the twentieth century are not bound to mass-production. The structure is still free, more free than ever before (though how long this may last is another question) and the architect still has every justification—indeed, a duty—to exploit this freedom whenever the opportunity arises by creating forms and spaces precisely appropriate to the occasion.

The Bauhaus line, which ran into the Miesian style, produces a building which is nothing if not a whole thing. Mies thinks in rectangles and in mass technology and has prompted a commercially and popularly accepted architectural language complete with a limited vocabulary. Mies points resolutely to a future of universal, impersonal envelopes. He has minimum difficulties with recalcitrant lift shafts. When he re-designs mail chutes, fire alarms and other fittings for his prouder buildings he is not re-designing normal industrial products to make them more special or precious, but to make them less so, to make them more universal, anonymous and characterless, to de-gild the industrial lily. A very large segment of the immediate future clearly belongs to Mies and his disciples. There can be no argument about that; the question is: will there also be some room for the acrobats and the poets?

Mies believes that his designs 'throw out everything that is not reasonable.' 'I don't want to be interesting,' he insists. 'I want to be good.' Yet the reasonableness of his planning for lack of privacy is interminably criticized by others. Moreover, the reasonableness of his preoccupation with proportion, and of hand-crafting a machine-made look, are open to question. A physically redundant steel mullion is not objectively more reasonable than a functionally redundant concrete curve; reasonableness is entirely relative to the accepted code. The great value of Mies as a leader is not that his followers' work is more reasonable but that it is, as he wishes, less 'interesting'; it is more impersonal, taciturn and expressionless. A world designed by the Mies school is acceptable—uninteresting enough to please anybody. But a world where every building is an exciting shape by a Candela or a Saarinen at the high pitches of their respective imaginations is not acceptable—it is a maniacally interesting prospect. But, happily, a choice between the two will not be given to architecture. The second prospect is impossible. The pieces of high acrobatics and high poetry will always be isolated incidents, simply because of the inherent nature of the acrobat and the poet always to be in the minority, no matter how high the levels of the common physique and the common prose are raised.

The suitability of the ordinary commercialized-Miesian curtain-wall grid as a universal backdrop, comparable to the eighteenth-century's repeating urban facade, has already been noted,² and the prospect of such a plain, impersonal, workaday background silhouetting a foreground of special gems seems generally acceptable. At the least it is a good compromise, since there will never be enough artists to make a gem of everything.

The most likely impediments to the development of this scheme are the commercial need to advertise and the egotistical urge of some owners and architects to raise monuments on their own inadequate ability. The danger of a fascinating mathematical shape like the hyperbolic paraboloid is that it is neither fish nor fowl, neither the jewel nor the black velvet. It is not uninteresting or flexible enough to be extended as an acceptable universal background and it does not promise all that we could desire in a foreground gem. The single saddle shape already has been used in its pure form for a farming pavilion, a political hall, a few houses, a restaurant or two, and countless unbuilt projects from churches to motels. The power of its compelling shape has been dissipated by indiscriminate use. It offers now an all-too-easy formula to the advertiser and egotist—a prefabricated emotional stress like a stock suspense situation in a melodrama. This is certainly not the fault of the innovators, but it must make them think.

The simplest and probably best way to study the galloping development of exciting building through its three stages to date is to follow Saarinen, the man who makes the moves first for his generation. The trail begins with the Mies influence unclouded, in the supremely regular, rectilinear and, indeed, reasonable General Motors' playground at Detroit.

² Machine Made America, AR May, 1957; British Curtain Walls, AR September, 1957.



33, the Kresge Auditorium at MIT; Eero Saarinen's first essay in structural 'shape'.

But 'there are many ways of being influenced by Mies,' says Saarinen. 'I would say that I have been most influenced by him in the MIT auditorium—not by his form but by his . . . principle of making structure the dominant element in architecture and letting the functional ones fit in.'³ This auditorium, 33, was Saarinen's first important essay in structural shape. The tri-cornered dome is, as he says, the dominant visual element—but its shape was not a structural concept. The dome had to be cramped like a highborn Chinese lady into the tiny pointed shoes, and suffered accordingly. And it was not a functional idea. Saarinen let the functional elements fit in, as he says, and finally the lid was shut. But the success was not inevitable; the container was neither a soft-sided zipper-bag nor a violin case; it was an inflexible piece of geometry, one-eighth of a sphere. To embrace its functional elements, about a quarter of its 'glass' area in the open segments of the dome had to be opaque. And it is not a visual, expressive or emotional idea. It does not convey music or meetings and it could have been made much prettier with more feet or more projections above the bulging glass—if prettiness had been the aim. The MIT auditorium was entirely an intellectual concept, as pure and cold as a Miesian cube but suggesting a break free from the cube, a tentative side-step round the curtain wall.

Eero Saarinen's next notable shape, the ice hockey

³ This and the previous quotations of Mies van der Rohe are from *Conversations Regarding the Future of Architecture*, Reynolds Metals' L/P record.



34, model of Yale Hockey Rink, by Saarinen and Associates—a further illustration, with part of the roof cut away, appears on page 300.

rink at Yale, 12, page 300, and 34, was more relaxed and less pure in shape, and with much more certainty it convinces as a structural-functional form. The upright arch of the central spine is matched on each side by the reclining arch of the beam round the back of the raised seating. Thus the basis of the two roof saddles is framed from functional requirements. Whether it was absolutely necessary to extend the central arch each end into a cupid's bow is another matter; at least the body of the building has an authentic and imperative air. But still any expressive qualities which it may have appear to be accidental; at the most one could claim that its hunch-backed curves express the swirling movements of young Ivy League gentlemen on skates.

For his next, third, exciting shape, Saarinen changed his starting point again. In the 'great bird,' the TWA air terminal at Idlewild, New York, 30, 35, function fits in and the structure is still dominant and convincing, but the stimulus was no longer intellectual, functional or structural. It was sculptural. Publishing the model of the design in January, 1958, *The Architectural Forum* explained, undoubtedly with the designers' consent, that the bird-like form was not



35, model of the central hall of Saarinen's TWA terminal at Idlewild.

mere caprice or design virtuosity but that 'Saarinen and co-designer Kevin Roche set the key to the planning in their design discussions: the sense of movement, which is an intrinsic part of a terminal, should show in the design.' The design team was described at work sculpturing the cardboard models, cutting, trying, altering and discussing. In the end they satisfied themselves in shaping the large model of the interior to a visual effect of flow, coinciding with the passengers' bodily movement through the building. There were some awkward pockets secreted round the services, as I have mentioned, and the main pedestrian bridge across the voluptuous space had a peculiar kink in the middle of which function could hardly approve. But to dwell on these points would be fatuous, and to question Saarinen's ultimate ability to assimilate the most advanced engineering ideas would be impertinent. The question is not the reasonableness of curved design. Few rectilinear buildings are without sin. The irregular building is victim to much more searching and spiteful scrutiny, but there is no inherent reason why a flowing shape

should be less functional than a square one—on the contrary, considering the human shape. The question facing Saarinen and all who would follow him is not the comparatively simple matter of mastering the technique of bending functional and structural requirements with acceptable logic. After the technique—the language—is mastered what have we of value to say?

In the ornithoid TWA building, Mendelsohn's early expressionism is given a workable plan, an integrated structure and an interior space just as carefully shaped as the external form. But, even with these great improvements, do the Mendelsohn dreams make sense in real life? The Saarinen trail leads to the fundamental nature of architectural expression.

The fascination which remote science holds for the architect has more calamitous effects than simply leading him to gratuitous adventures in structure. It also leads to lapses of logic like the *Modulor*, to unfledged flights into space-time theories and, perhaps most calamitously, into attempts to rationalize the delights of architecture and to devise formulas for beauty. Gropius suggested the outlines for a scientific study of design which could lead to a precise understanding of the various biological facts of seeing, and 'what influences the psyche of man in terms of light, scale, shape, form and colour.' He was careful to warn that this science of technique could never become 'a recipe, or a substitute for art . . . The intuitive directness, the short cut of a brilliant mind, is ever needed . . .'⁴ But today architecture's main weakness is not in the science of design practice, but in the belief that this is all there is to architecture. The record of the structural-shape buildings is packed with brilliant short cuts, and still is unsatisfying. The lack is not of technique or technology or science of design, but of heart in the centre of design. The modern building tends either to be numb or to be self-conscious in its selection of the motive on which all else is built.

Much of the engineering of excitement is so strong and confident that it may delude us for a moment that it is leading to new realms of architectural beauty. But all the shapes of architecture, cleaned of association, are of equal importance or insignificance in the cosmic pattern. The world's reaction is affected only by surprise in the unfamiliar and associations of the familiar, and the ultimate satisfaction is achieved only when the reaction is singular and appropriate to the human experience involved in the function. Appropriateness of expression has been the aim in the initial thought behind most of the new shape buildings. Stubbins's Congress Hall, 11, on the fringe of Berlin's Iron Curtain clearly sought to express the concept of freedom in the speech which it was built to

house. One result of this was that Mrs. Claire Booth Luce was quoted as saying, 'it seems a little to fly.' Utzon's Sydney Opera House grew from the water, the wind, and the white sails on the harbour. A restaurant by the sea in Puerto Rico by Toro-Ferrer is covered by a concrete shell which is a magnified adaptation of a sea shell. In TWA Saarinen and Roche let the movement of the crowd lead them. But all this is symbolism, advertising on the highest plane, and not the appropriateness of an enclosure as experienced by an occupant. If curves and swirls really convey a feeling of movement, then the TWA building could be called the only appropriate building in this group. Yet if they do, a bigger question arises: does a feeling of movement genuinely reflect the average passenger's emotional state while waiting for his flight signal? The mutual adjustment of the spatial expression and the psychological state of a sensitive occupant is more valuable than any symbol, and a poetic description of a reality is more rewarding than a literal translation of a poetic abstraction.

Simplicity has now climbed, on fashion rather than conviction, to a precarious height of popularity, and is in danger of toppling in favour of some sort of new Art Nouveau or other revival of enrichment. Suggestions that Adolf Loos went too far are coming now from unexpected quarters. Infant civilization still demands the paint and feathers. At this critical time the structural-shape building gallops on to the stage, the great white hope for the sensible relief of architectural boredom. But the exciting shape is not, heaven help us, possible for all buildings. Architecture will have another nervous breakdown if it tries to find the common denominator of the two separate thought processes which lead to a technologist's envelope and a poet's embrace, even when each happens to be a dome. Architectural poetry is not practically possible for every building and must at least be limited to the poetic potential of the community. The problem is how to control the irresponsible gymnastics and to restrict the galloping new movement to genuine poetry. Firstly, the engineering of excitement must practise relevance and curb its somewhat disconcerting propensity to appear to fly no matter what the occasion. Secondly, the audience has to be trained to see the line which divides any sincere expression from the displays and advertisements, and to keep raising the line another peg. Then the engineers of excitement will lose their self-consciousness. At present many of them are inclined to the old architectural failing of seeking simultaneously commodity, firmness and delight; and delight is so elusive when hotly pursued. It is more likely to be caught off-guard when the designer is seeking merely commodity and firmness in the right frame of mind.

⁴ *Scope of Total Architecture* (George Allen & Unwin Ltd.), pp. 38-49.



the exploring eye

Of all the architectural disasters of our time, none can have been more spectacular, more discussed, left fewer scars or created more legends than the fall of the Campanile in the Piazza di San Marco, Venice. The reason for the legends is obvious—in the almost total collapse of this 322-foot structure of brick and stone, not a person nor a pigeon perished, with the result that the Venetians, apostrophizing the angel that had stood on its pinnacle since Sanudo saw it offered up in 1513, declared 'Luxe sempre sta galantomio . . . he was ever the gentleman; he spoke, he warned us; stand aside while I fall . . . fe largo che casco.' This folk saying devalues a legend current among sentimental Anglo-Saxons; that the Campanile fell without warning on a Sunday morning, and the pious Venetians were preserved because at that hour on that day they were all at Mass.

In fact, the imminence of disaster had been common knowledge for two days before the fall. The main shaft of the tower, battered by wind and weather, rocked by earthquakes and scorched by lightning, had stood on its barely-adequate foundations since at least 1148. Much of the structure was of selected Roman brick of the first quality, but the elements had begun to take their toll, and it was a seepage of rainwater into Sansovino's Loggia that stands against base of the shaft that triggered the final chain of events.

In the course of an attempted repair, a stone coping above the Loggia roof was cut out—not by stages, as might be expected, but in one run, leaving a slot across the face of the tower, that was on Monday, July 7, 1902, and, although the state of the brickwork was found to be unsatisfactory, no proper inspection of the structure was made until the following Thursday. Before any action could be taken, there appeared on the Saturday a crack, starting from the newly-cut slot, running screw-wise across two faces of the tower, and then from window to window up one corner buttress. The evening music in the Piazza was cancelled, and an uneasy Sunday passed. On Monday morning dust began to pour from the crack, then bricks began to fall and blocks of stone. The danger area was cleared, and at 9.47 a.m. on July 14, 1902, in almost complete silence and a column of brick dust and pulverized mortar, the Campanile collapsed where it stood. The damage to other buildings was miraculously slight—San Marco was slightly chipped, the upper storey of the return of Sansovino's Libreria was broken in, and from beneath the rubble a great deal of the Loggia was recovered in quite good order.

When it is considered how much damage could have been caused had the tower fallen, say, on the corner of San Marco, or on the Doges Palace, or even across the top of the Libreria, it seems no more than gratitude to an uncommonly benevolent providence that the Campanile should have been rebuilt brick for brick, exactly as it was.



As it stood, and as it stands rebuilt, the Campanile in the Piazza di San Marco was more than a noble pile, a symbol of Venice and a navigation mark for the shipping on the Lagoon. Its precise location at the junction of the main Piazza and the lesser Piazzetta was so subtle a piece of town-planning (incidentally no doubt) that generations of artists had difficulty in indicating that precise location in this engraving by Israel Silvestre the artist has located it twelve bags too far along the front of the Procuratie.

1,2



3



4

1, rarely can the historian regret so deeply the obvious lack of authenticity of an historical document as in the case of this action shot of the collapse of the Campanile. Whatever may be argued in its favour on grounds of the traditional impassivity of the Venetian pigeon (lower right), the cloud of dust is patently hand-made (apparently under the influence of Leonardo da Vinci) and the Angel is facing the wrong way on the roof. Nevertheless, the curious tilt of the settling tower suggests that this is at least the reconstruction of what an eyewitness actually saw.

2 and **3**, about these two views of the great mound of debris there is no doubt at all; they accord perfectly with the literary records, which describe how the wreckage extended from the face of the *Procuratie* across to the porches of San Marco, and how the great bell, *Marangona*, survived (it is seen on top of the rubble in 2) alone of the five bells that originally hung in the tower.

4, the two bays of the return face of the *Libreria* were the only other works of architectural importance (beside the *Loggia*, which was annexed to the base of the tower) to be seriously damaged by the fall of the Campanile, but even here, as will be seen, the damage was extremely local.

5, the work of restoration pro-

ceeded smartly, once it had been put in hand and the rebuilt Campanile was all but complete in the early part of 1909. In this progress picture the restored end of the *Libreria* is seen, also the bracketed scaffolding in a tradition that goes back at least to Brunelleschi, and the remarkably small area of the Piazza that was obstructed at ground level by the works.

6 and **7**, when it came to the recon-

struction the pa-
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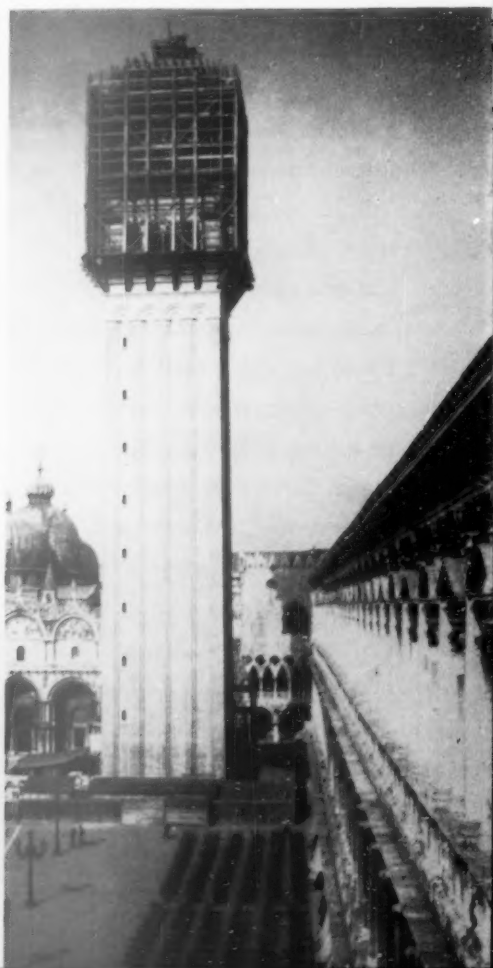
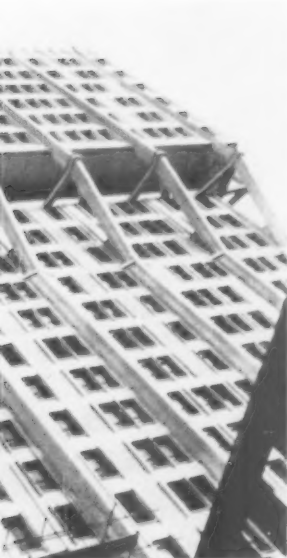
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elevation.
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vertically.



struction of the bell chamber and
the parts above there was in-
sufficient solid masonry to continue
bracketing the scaffold, and a full
page had to be made, springing
from the first projecting cornice
below. The resultant structure may
well look familiar to mid-century
eyes, for something like it must
surely have been the inspiration for
BPR's Torre Velasca, 7, com-
pleted only last year in Milan.



TWO BUILDINGS BY JOHN B. PARKIN

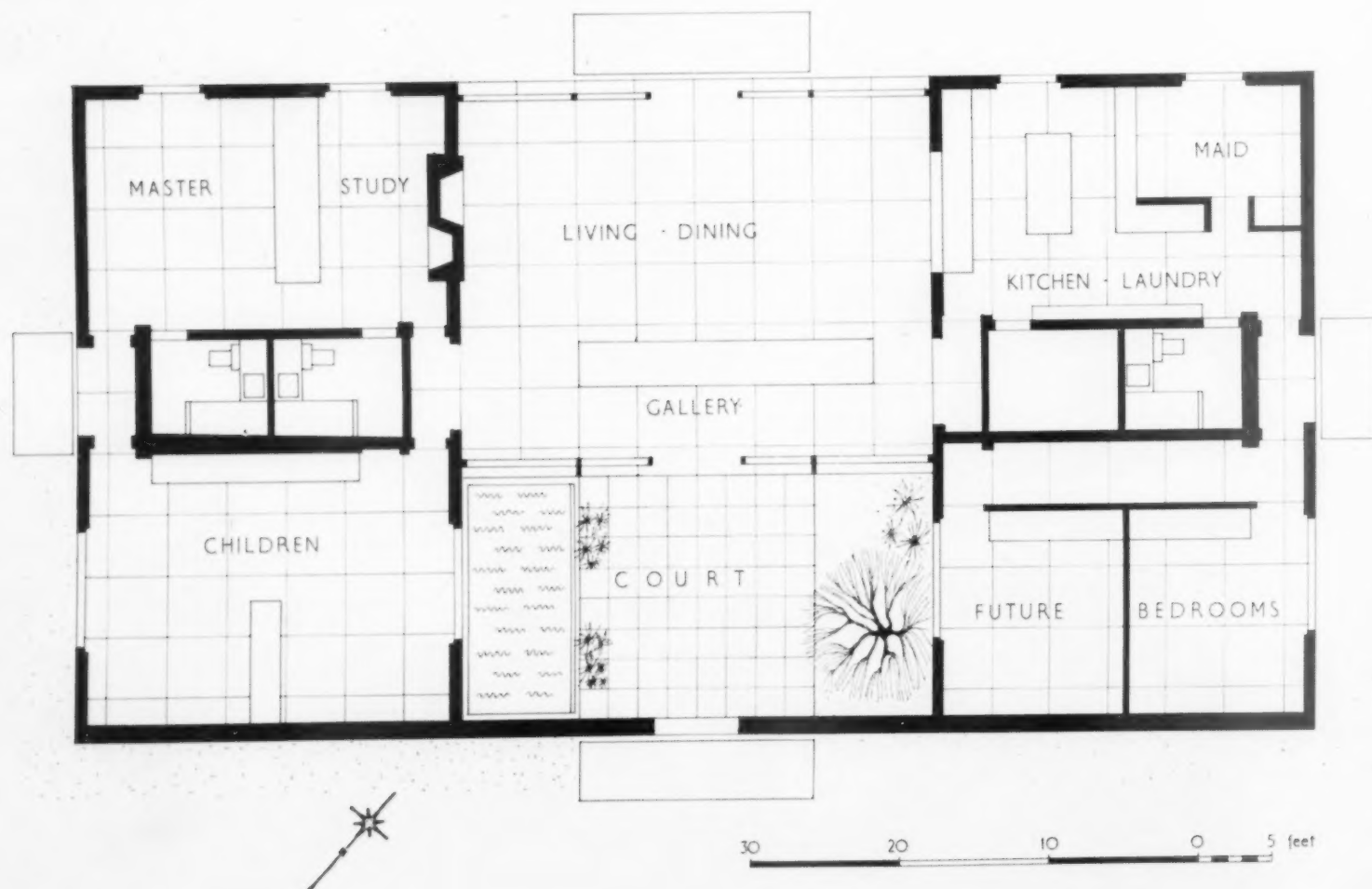
1, HOUSE NEAR TORONTO

The architect designed this house at Todmorden (a suburb of Toronto, Ontario) for his own occupation, on classic principals: it is set on an earth podium and approached diagonally so that two elevations are seen obliquely in the Grecian manner, which is also apparent in the proportions of the windows and walls and the grouping of the rooms around a courtyard. The accommodation varies from the completely open terrace on the south, to the semi-enclosed courtyard, and from the wide expanse of window in the living-room to the small, intimate study.

Materials have been chosen for easy maintenance and

include glazed white bricks spotted in black, whitish Botticino marble terrazzo, an exposed precast prestressed concrete roof and oiled walnut casings. There is full air conditioning and the flat roof is flooded in summer for coolness. Glazing is double and the heating is by warm air pipes in the floor with slots under the windows which give a combination of radiant and convection heating. The bathroom and service core forms a sound buffer between the children's area and the study and master bedroom.

Those involved with the building include John C. Parkin, partner for design; J. E. Mews, associate/mechanical engineering; R. F. Marshall, associate/structural engineering; R. B. Gordon, project architect.



ASSOCIATES

1. north-west entrance elevation.
2. view of the entrance court from within; like the rest of the house this is designed on the basis of a four foot module, both horizontally and vertically.





3

3. the north-east and north-west elevations. The house is approached diagonally so that two elevations are seen obliquely. There is a centrally-placed concrete platform in front of the doors on each of the four façades.
4. looking from the courtyard towards the glass walled gallery with study beyond on the left and living/dining

room on the right. Lighting is dimmer-controlled throughout the house, and there are hidden lights in the courtyard and pool.
5. living room with glass wall on the right. Natural leather is used on the 'Barcelona' chairs and the carpet is mushroom coloured. Here as in the rest of the house all colours are low keyed.

HOUSE NEAR TORONTO



4



5



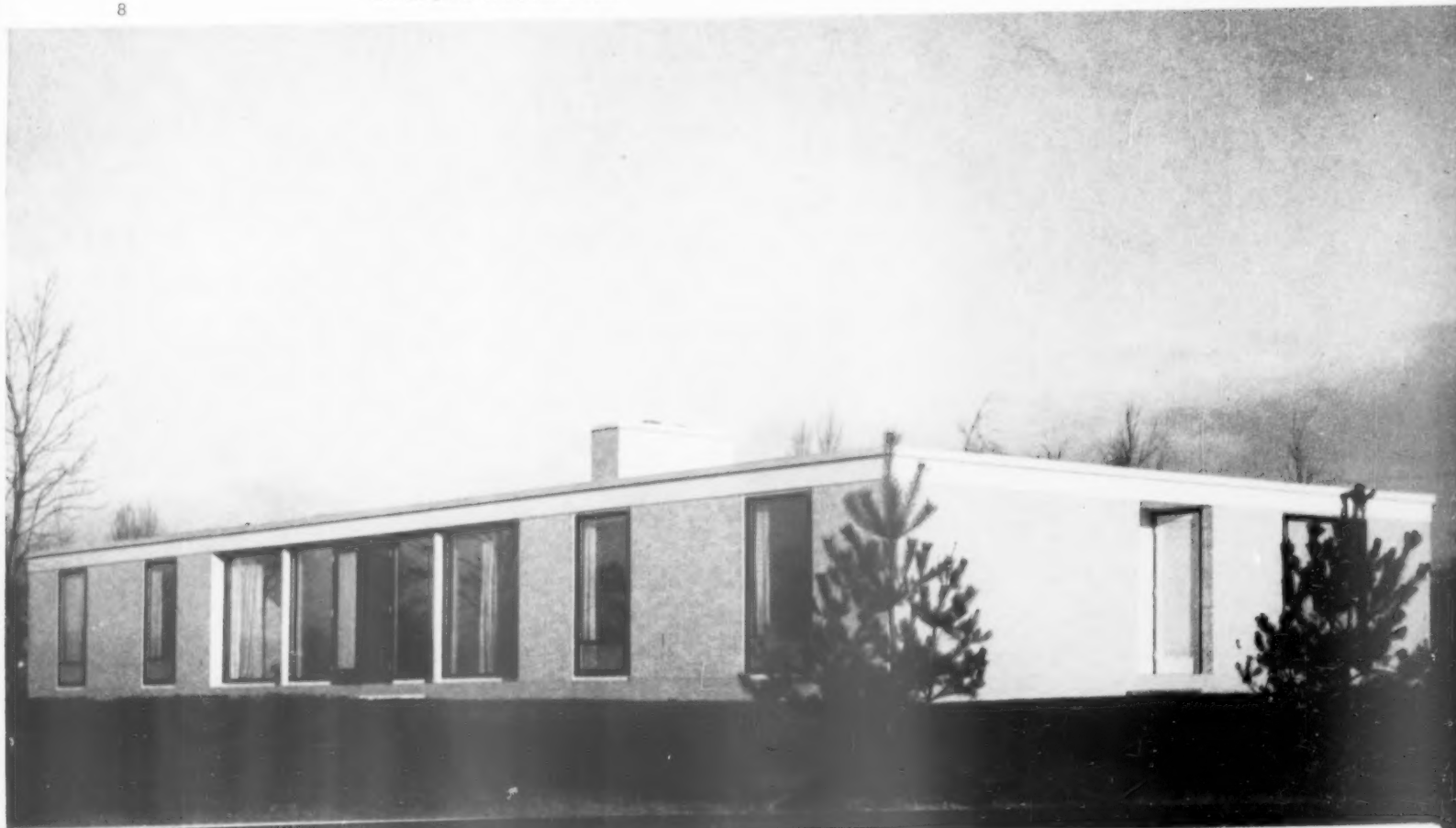
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6. view of the living room.
The cabinets which are approximately six feet high are not ceiling height. They are one module wide so that they can be put together in various combinations.
7. the gallery facing the courtyard. The marble terrazzo is off-white and the walnut cases are matt finished with Tung oil.
8. view from the east showing the all-glass living room wall.

7



8



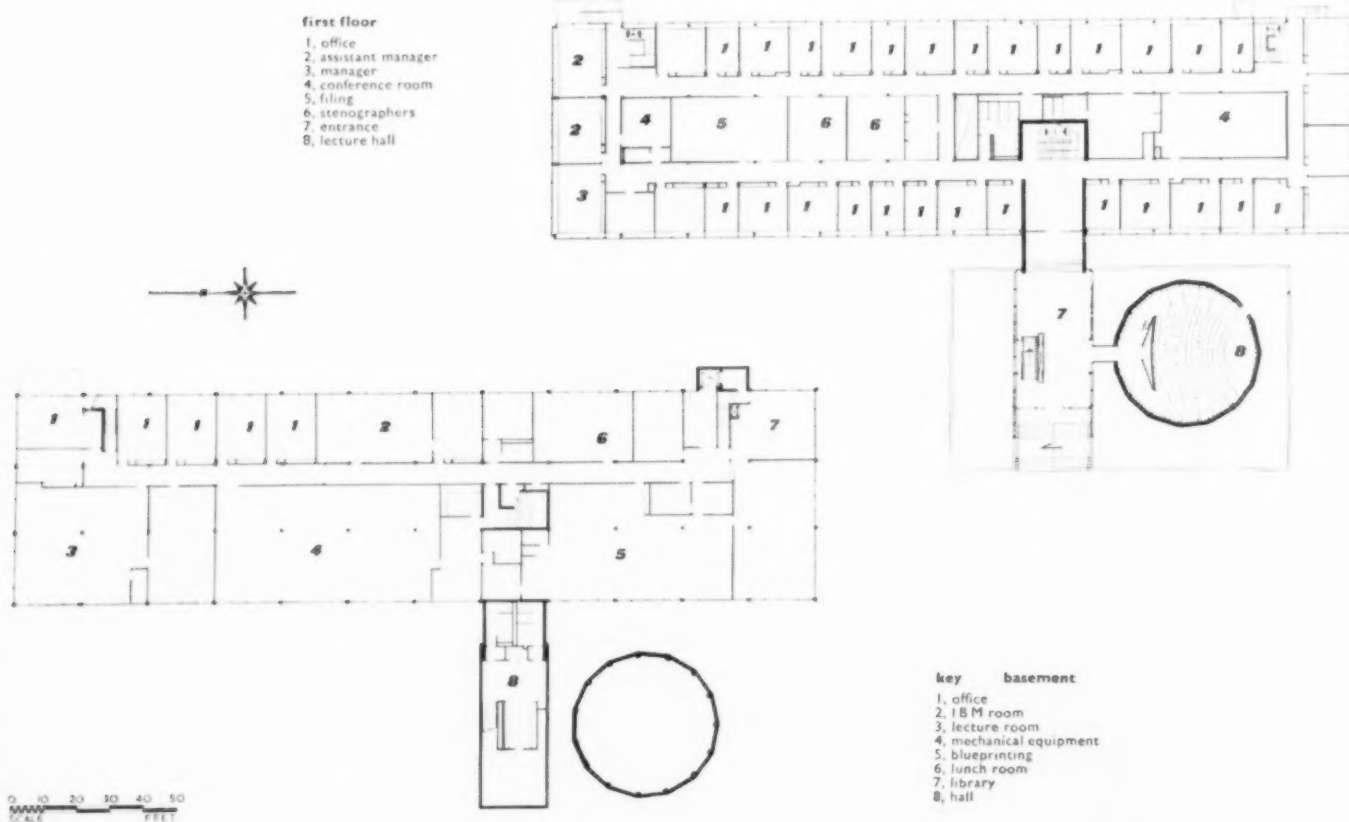
2, OFFICES AT SARNIA, ONTARIO

A fully air-conditioned building was required for the engineers, analysts and technicians of Imperial Oil. It is sited across the road from the Sarnia Oil Refinery, on a former parking lot, and is linked visually and functionally with the refinery by a circular assembly hall, used for meetings, lectures and films. The building is planned on a five-foot module, and on two floors, with a double corridor giving all private offices good natural light and a pleasant outlook. The conference rooms, stenographers, and cloakrooms are centralized between the corridors.

The construction is of a welded steel framework on a reinforced concrete raft, which floats on a 13-ft. layer of firm clay. The outer skin of the building is of double glazing and porcelain enamelled panels backed by an air space and interior panels of 4-in. wood chip aggregate concrete, all held by extruded anodized aluminium sections. The lecture hall, which serves both the offices

and refinery, is linked to the main building by the entrance foyer. Heating and air conditioning are combined in one system, similar to that used in the United Nations building. The porcelain enamelled panels are light blue-grey, the glazing beads are black. Exposed steel is painted white. The entrance foyer and lobby have floors of Travertine marble chips in self-coloured matrix; beige rubber tiles are used in the corridors, greyish-brown lino tiles in the offices, and neutral broadloom carpets in the conference rooms and managers' offices. Wall colours light greenish-grey and off-white with accents of blue, grey-greenish-yellow and Indian red.

Those responsible for the project include John C. Parkin, partner for design; John E. Owen, associate in charge; J. E. Mews, associate/mechanical engineering; R. F. Marshall, associate/structural engineering; Maxwell J. Miller, project architect.



9. view from the north showing the main entrance. On the extreme right is the road with the refinery beyond.
 10. looking north with lecture hall and connecting neck to the main building. The lecture hall with its exterior wall of purplish brick in fifteen panels, contrasts with the curtain wall façades of the main building.





11

OFFICES AT SARNIA, ONTARIO

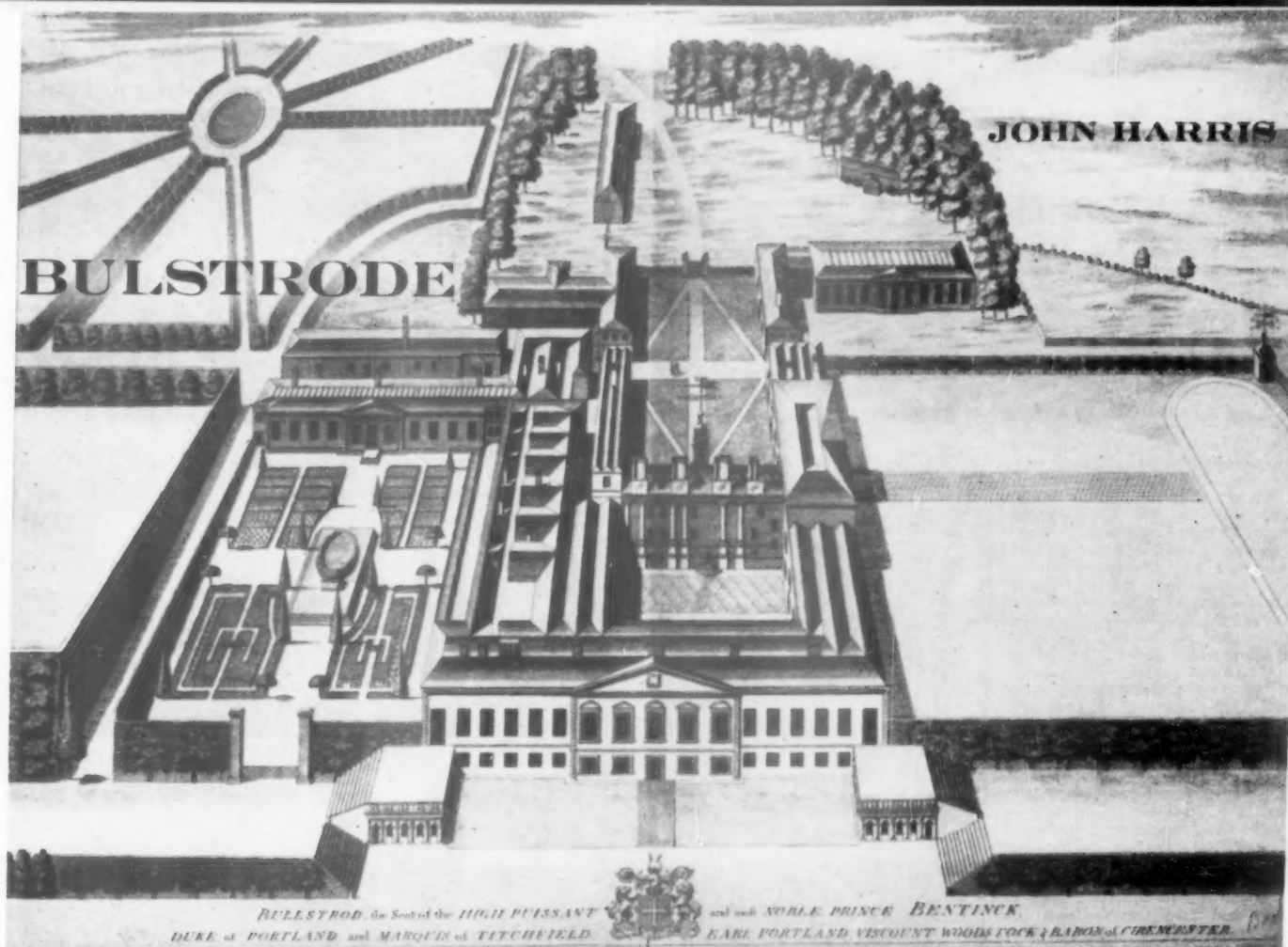


13



12

11, interior of lecture hall. It has recessed incandescent lighting on a dimmer control. Devices to control the acoustics include white oak strips on the ceiling which act as a reinforcing reflective surface; unwanted side wall reflections which would tend to concentrate in the centre are diffused by the vertical 2in. by 8in. fins placed in random pattern, and absorbed by varying and progressively greater amounts of fibreglass on the walls behind the fins.
12, projection booth over entrance to lecture hall; the vertical fins are on the right.
13, entrance hall and exterior wall of lecture hall.



The history of English architecture is impoverished not only by the demolition of known masterpieces, but also by alterations, neglect, subsequent repair, and other vicissitudes that wear away character from buildings. Yet quite unprepossessing piles may once have been significant monuments, and may still conceal fragments of their former greatness. A case in point is Bulstrode House in Buckinghamshire, which interests few historians today, and yet has engaged the attention of many famous hands in architecture and the decorative arts.

The visual story of Bulstrode begins in 1676 when Judge Jeffries bought the house and in 1685 when he had begun to rebuild. By 1688 he was imprisoned and in the following year died. A fire must have occurred between 1676 and 1712, for Horace Walpole mentions that the ceiling of the Chapel 'was formerly decorated with the assumption or rather presumption of Chancellor Jeffries to whom it belonged; but a very judicious fire hurried him somewhere else.' This suggests that Jeffries had his Chapel painted, perhaps by Nicholas Heude, soon after acquiring the property and that the fire took place early in the eighteenth century.

The engravings of Thomas Bowles circa 1750 are the only evidence as to the disposition of the house and park. Two engravings give southern bird's-eye views, one close showing the house in detail, above, the other at a distance, depicting the surrounding formality of garden. The south front extended 200 feet, of brick with one principal floor and basement storey. The architectural interest of this otherwise typical late Restoration façade lay in that it consisted of only one floor with exits at the ends leading on to balustraded platforms. A French source is suggested, supported by Jeffries' pro-catholic tendencies.

Behind this front were two courts, the division between them being formed by the Hall of the earlier house. The tall ungainly Ionic pilasters and cupola may have been due to a classicizing in the 1640's. The farther court, flanked by stable and outbuildings built from earlier materials, was closed on the north by a low brick wall and ball-finished gateway. This was the secondary approach to the house. The main entry or grand approach would have been by the gazebo-fronted forecourt on the east, from which a pathway led to the east front screening a high Hall of two storeys behind its pedimented centre.

The wings shown in the view may have been added after 1706 when the estate had been purchased by William Bentinck, Earl of Portland, from Charles Dive, Jeffries' son-in-law. These additions comprised a west wing at right angles to the west front, and an easterly extension farther north from the east side of the stable court. Both reflected in little the disposition of the south front.

Of the interior few descriptions exist. The south front contained the main suite of rooms extending to the east front with the Dining Room next to the Hall. Facing north to the interior court and extending across its whole width was, voicing Walpole,

'a brave gallery of old pictures.' From the end of this gallery opened the Chapel.

This was decorated by Sebastiano Ricci between 1712 and 1716 for the 2nd Earl, later 1st Duke, of Portland. It made a considerable impression upon contemporaries, comparable to the Chapel of Lord Chandos at Cannons, which it resembled in certain particulars. The dimensions were 40 by 30 feet with a gallery at the west end. On each side of the altar was a stained glass window designed by Ricci and executed by Joshua Price. Above the altar hung Van Dyck's Madonna and Child. The importance of the Chapel is that it was one of the few ecclesiastical decorative schemes carried out by the Italian painters who came to England in anticipation of the St. Paul's dome competition. The Cannons Chapel (by Francesco Sileto, Antonio Bellucci and Joshua Price) exists in a much reconstructed form at Great Witley, and the Chapel at Kimbolton Castle (by Giantonio Pelligrini) consists only of a simple form of decoration in which easel paintings are set into the wall panels. At Bulstrode was a complete integrated scheme of Venetian wall painting. The lower part of the walls was wainscoted in cedar, above which was painted, either on canvas,

or more likely with oil on plaster, a framework of tromp-l'oeil pilasters and allegorical figures on scrolled brackets. Each wall was centred by an arched architectural composition. In the left was the Last Supper, in the right the Baptism of Christ. 2. Above the gallery was the Purification of the Virgin, mistakenly identified by Vertue as a Salutation. The ceiling may have been of stucco, framing an Ascension in an oval central compartment. Jeffry Wyatt's plans of 1812 still show the Chapel in its old position and Daniel Lysons mentions the paintings in 1847. They may therefore have been destroyed as late as 1860 when the present house was built.

Vertue saw two rooms painted for Lord Jeffries, in one of which were figures representing the Four Continents. Nicholas Heude signed the ceiling including a self-portrait with palette in hand as part of the composition. Georgiana Duchess of Devonshire wrote of the 'old reading closet' being 'vastly pretty' and saw a 'pretty little oratoire with fine painted windows.' The busts of Queen Elizabeth and King Edward VI in the Hall, and a 'shuffleboard of plum pudding marble of a vast size' came from Theobalds Palace. There were two statues by Joseph Wilton in the Great Drawing Room

which may have been copies of classical works now unidentifiable. The collection of paintings can easily be reassembled from those that passed to Welbeck Abbey, the descriptions by Vertue, and the catalogue of portraits made in 1762 by Sir William Musgrave.

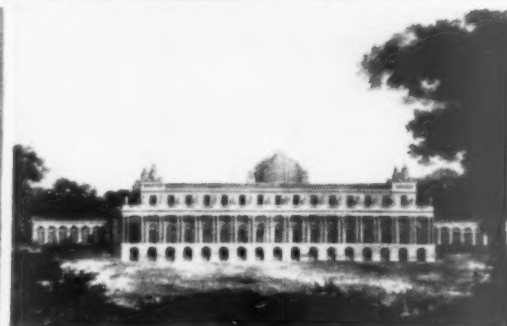
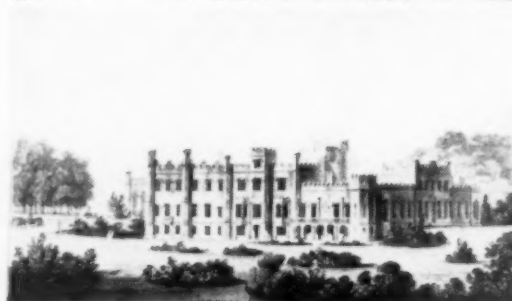
Walpole thought the house 'Dutch and triste,' writing to George Montague that 'the pictures you mention in the gallery would be curious if they knew one from another; but the names are lost, and they are only sure that they have so many pounds of ancestors in the 'ump.'

William Bentinck died at Bulstrode on November 23, 1709. The 2nd Earl was often absent from the house but as well as commissioning the decoration of the Chapel may have employed Ricci for certain works at his house in St. James' Square. It was with his wife the Duchess Margaret that Bulstrode acquired the reputation as a haunt of literati and blue-stocking pastimes. Then Mrs. Delany introduced her hobby of shell work with which she decorated the house and gardens. She designed the grotto, 1, at the head of the long water, sketched by Grimm in 1781. The Reverend John Lightfoot, author of *Flora Scotia*, combined the functions of Chaplain, Librarian, and Museum Curator. Until the Duchess's death in 1785 there prevailed a light-hearted atmosphere. She was a keen botanist and established a famous menagerie where the Duchess of Devonshire thought the porcupine 'quite frightful'. Margaret's friends included the Garricks, Boswell, General Paoli, Edward Young and Rousseau. To the latter she sent little parcels of books and rare flowers from the gardens. She was a great patroness of Ehret who painted for her exotic flowers on vellum. These must have contributed a feminine gaiety to the interior and belied Walpole's 'melancholy monument of Dutch magnificence.'

The melancholy moment came with the sale of the Duchess's effects in April, 1786. A great conchological and natural history collection as well as many works of art (including the Portland Vase) were dispersed. There can be no more evocative reminder of the spirit of the place than the engraved frontispiece to the sale catalogue which shows an imaginary corner of the Duchess's museum.

The gardens began as a formal layout, and existed as such until they were improved by Humphry Repton about 1802-1805. Although documentary evidence is lacking their early character can perhaps be attributed to Henry Wise who was until 1702 under the Earl of Portland on the Royal Gardens. There is no reason why their relationship should not have extended afterwards. Repton described the situation of the park in his *Observations* published in 1805. From his plan it can be seen that the house retains its Portland disposition, as yet unchanged by James Wyatt's rebuild. He comments that upon the great work 'are occasionally employed among the more efficient labourers, an hundred children from ten to fifteen years old, who are thus early trained to habits of wholesome industry . . . no object can be more delightful than the park scenery thus animated.'

At the beginning of Repton's work John Nash made a design, exhibited at the Royal Academy in 1802, for rebuilding the house. The exhibited painting, 4, done by George Stanley Repton shows the house enclosed in a classical skin, with a dome, colonnade and low orangeries



- 1 2 1, drawing by Grimm of the shell grotto.
- 3 4 2, one of the wall paintings in the
- 5 6 chapel, of the Baptism of Christ.
- 7 3, James Wyatt's reconstruction of the west wing.

4, John Nash's design, in 1802, for rebuilding in a classical style.

5, Jeffry Wyatt's design, produced in 1812, would have involved rebuilding most of the new work.

6, the present house, built by Benjamin Ferrey in 1860.

7, James Wyatt's garden entrance, originally part of the house but now isolated.

projecting from either side. All the elements of the old house transformed to an exotic effect.

James Wyatt's commission to build a new house can be dated between 1805 and the death of the 3rd Duke in 1809. The Duke's insecure finances caused work to slow up and it is known that Wyatt was owed £4,000 for his trouble. The building stopped suddenly and was not resumed until 1860.

It is possible to reconstruct this incomplete scheme from two views made by John Buckler in 1818 when the house had been sold to the 11th Duke of Somerset. A castellated Tudor style wing, 3, has taken the place of the old western one and two thirds of the south front rebuilt. A sketch from the south-east contrasts the old east front in a state of ruin with the eastern wing still intact. Previously the terrace

platforms had been demolished and their doorways converted to windows, making a group of four above an ironwork balcony. Perhaps this was the result of John Nash's alterations. The only remnant of Wyatt's work today is the porch of the garden entrance, 7. When it became isolated from the house in 1860 an eastern façade was added to make it a free-standing structure.

The Duke of Somerset purchased the estate in 1811 for £35,000 and called in a bevy of architects to prepare schemes for the completion. The first consulted was Robert Smirke, as recorded in Joseph Farington's Diary for September, 1811. In 1812 both Jeffry Wyatt, 5, and Francis Sandys produced designs. These architects proposed an almost complete rebuilding of what had already been newly erected. P. F. Robinson exhibited

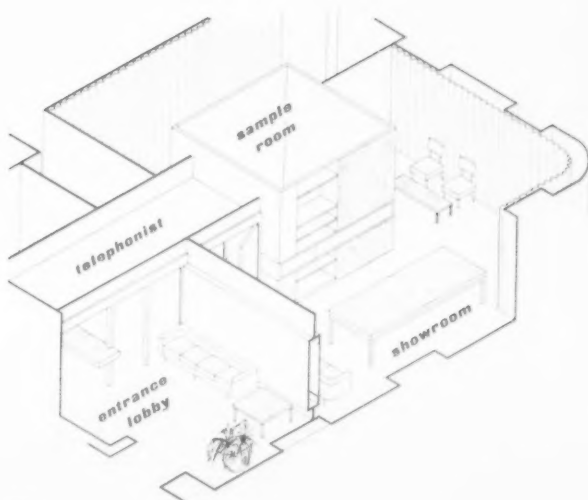
a design at the Royal Academy in 1819. He may have been responsible for the pretty example of cottage orné near the northern end of the long water.

Sales of timber and building materials took place between 1811 and 1825. The whole estate seems to have been prepared for auction in 1814 when Mr. Christie mentions 'an ornamental sheet of water and a Turkish pavilion.' The 11th Duke had given up any idea of making Bulstrode his permanent home and it remained in an unfinished but habitable state until the present house, 6, was built by Benjamin Ferrey for the 12th Duke in 1860. Many of the interiors were altered by F. C. Eden in a Neo-Georgian manner at the end of the century, since when the house has decayed and the formality around been overlaid by rhododendrons.

ID

a monthly review of interior design

This is the entire second floor of an office block completed since the war. The form of this space is an 'L,' the planning of which fell into two parts: first the area containing the entrance lobby and showroom, which was considerably altered, and second the general office space. In the first area there is a succession of spaces formed by partitions, one of these is an area of internal circulation with a lowered ceiling somewhat in the manner of a pergola.



1. view from general office past pergola area to a showroom beyond with sample room on the left.

Showroom and Offices at Gt. Portland St., W.1

architects: Chamberlin, Powell and Bon



2

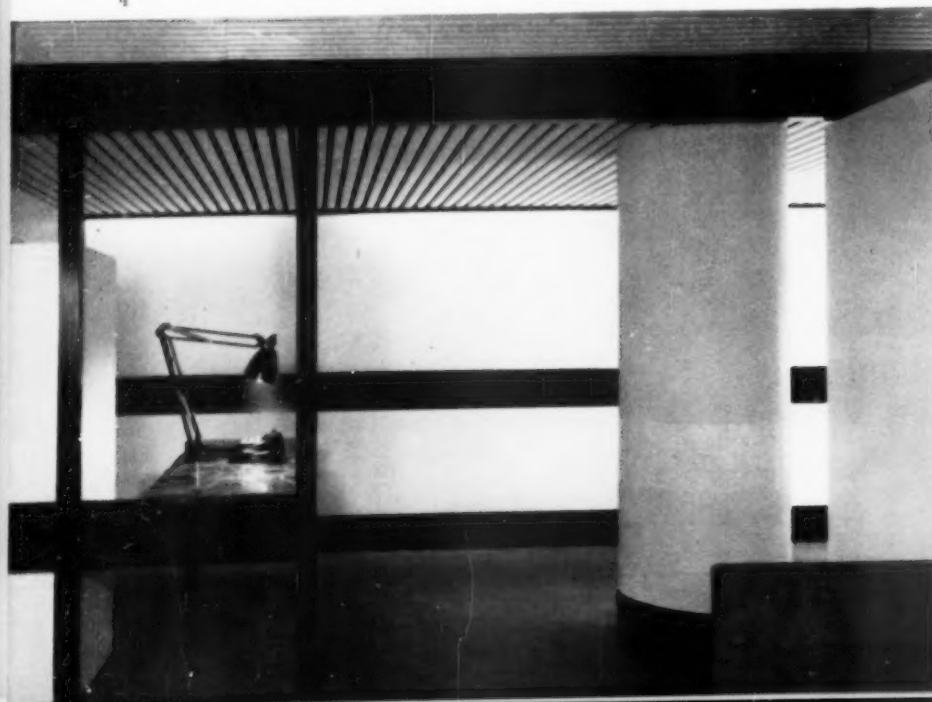
2. corner of the pergola area adjacent to receptionist showing entrance lobby with entrance doors to the right and mural to the left. A recessed mirror gives an impression of continuity.
3. the directors' office with recessed cupboard for intercom, telephone, etc.



3

The ceiling is softwood slats painted white and the carpet is charcoal grey.
4. view from entrance lobby to pergola area with the receptionist's desk and telephone switchboard on the left. The marble table is of Rosso Levanto and the lowered ceiling of the pergola

4



5

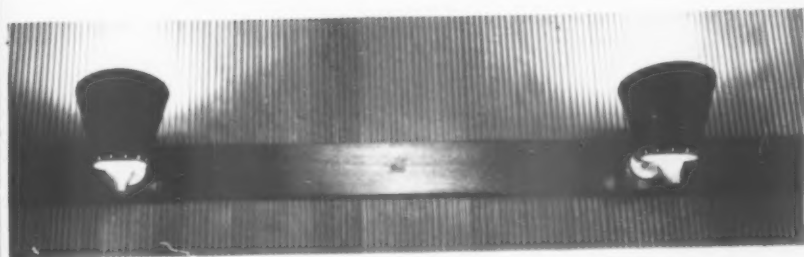
is of softwood with a frame of ebonized hardwood. To the right is a structural column which is encased and has a skirting and dado rail of mosaic. The carpet is scarlet.
5. looking into the entrance lobby with mural by R. A. Brandt.

Offices in Chancery Lane, W.C.2

architects: J. M. Austin-Smith & Partners
partner in charge: P. J. Lord

These offices for the New Zealand Meat Producers' Board occupy part of the second floor of Chancery House, a building designed by Sir Albert Richardson. The suite consists of an entrance hall and reception area, offices and a board room and directors' dining room connected by a central corridor. Electric floor heating is used throughout the building.

6. light fittings in the entrance hall are set on a 5in. horizontal mahogany member at door height which continues round the reception area and



6

along the corridor. The wall panelling is of 3in. vertical strips of stained beed with deep ribs, the strips secretly fixed, giving an overall effect of sharp corrugations.

7. typist's desk in the entrance hall designed by the architects; it is of mahogany and weathered sycamore with steel structural members and surround to the drawer unit. The folding typewriter bed is shown on the left. White statuary marble is used on the wall behind the desk and the floor is of black and white linoleum in 2in. by 24in. strips.

8. the corridor, the height of which has been reduced and the proportion improved by a repetition of the fan-light effect at floor level. The panelling and doors are of birch faced ply and the floor is black linoleum tiles.



7



8

Offices at Bedford Square, W.C.1

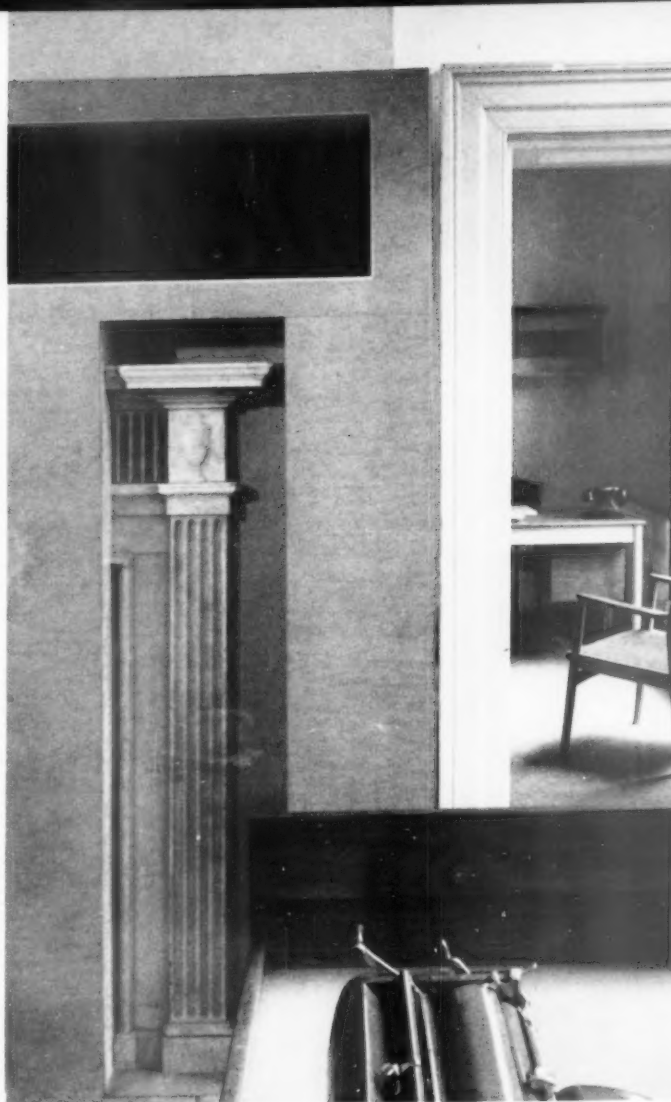
architect : Trevor Dannatt

These offices at 12, Bedford Square were redesigned to include an enquiry counter, general secretarial space, telephone switchboard with a small waiting area outside the general circulation. A room at the rear approached from the reception office was sub-divided with a half-glazed screen, redecorated and furnished to provide additional office space.

9, detail of birch veneered screen to fireplace with glazed slot exposing part of Adam design.

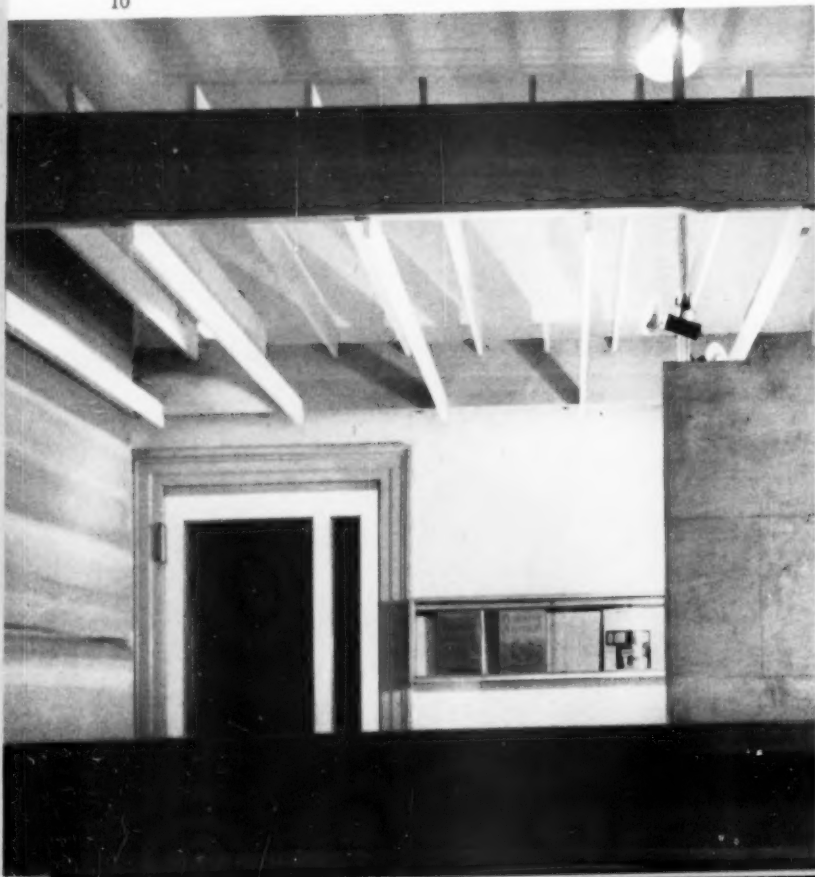
10, view of ceiling and birch veneered screen. The ceiling is lowered and consists of wood slats at two levels and at different spacings between two deep members. General lighting is from the brass lighting column which has a reflector fitting shining on to the ceiling of the room and another shining down on top of the slatted ceiling. The room is painted white throughout, with grey woodwork.

11, mural panel by Patrick Heron which occupies most of the end wall in this view; it is envisaged by the artist as creating a painterly space in a contrapuntal relationship to the three-dimensional space composition formed by the slats overhead.

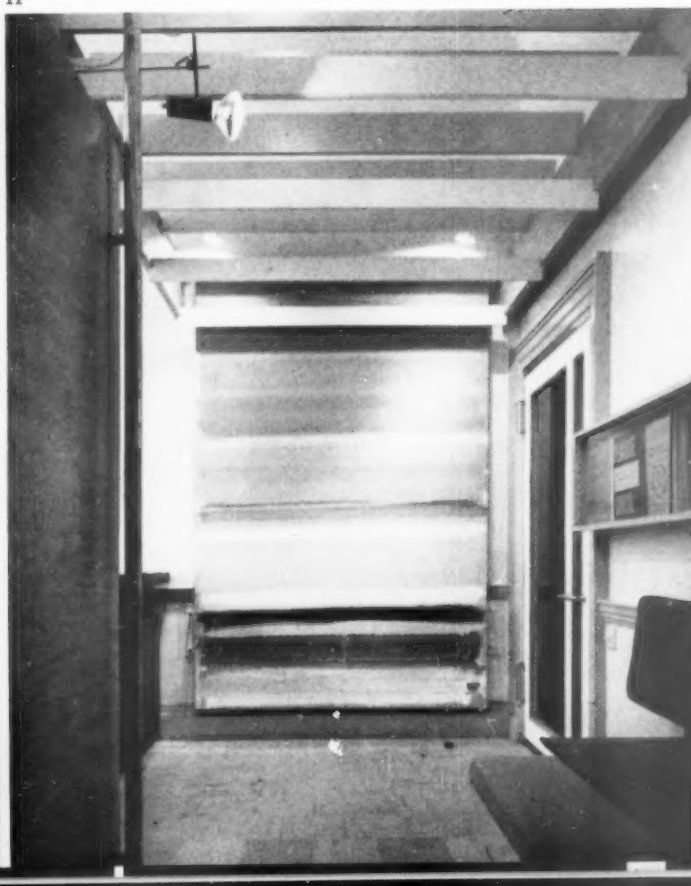


9

10



11



DR

design review



glass bowls and vases:

The showrooms of J. Wuidart and Co., in Rathbone Place, have recently been redesigned by R. Stennett-Wilson and provide an excellent background for their collection of imported glass and pottery. Among the exhibits there are two new designs for Orrefors by Nils Landberg. There is such complete contrast of character between them that it is difficult to imagine both coming from the same designer.

The bowls shown in 1, are of steel blue potash crystal and express the floating bubble-like quality of thinly blown glass of even thickness.

In 2, the group of vases are of double gathered full lead crystal with a grey green centre encased in a massive clear outer wall making full use of the material's ability to gain effect and lustre from the refraction of light.

In this craft the extraordinarily high degree of technical skill required inevitably leads to a division of responsibility between designer, chemist and glass blower, and only the most intimate collaboration between them can produce pieces of the quality shown here.

The smallest of the crystal vases is approximately 6½ in. high and wholesale prices for the various sizes range from 38s. 9d. to 75s. 6d., while the bowls are from 5 in. to 9 in. high and the wholesale price of the medium size is about 23s.





students' work: This year's exhibition of work by students of the Royal College of Art, called 'A Room of Our Own', was held last month. It was designed by a team of students and furnished with 65 articles representing the co-ordinated effort of the seven schools of Industrial Design. Industry co-operated to produce prototypes and many of the exhibits are now in production.

The four examples illustrated were all made in the College workshops.

The desk light 3, designed by Leonard Summers, is outstanding. It is made of anodised aluminium and brass and is adjustable vertically and horizontally. This is an austere but elegant design of a quality so frequently only found in imported fittings and would be welcomed by architects here. Unhappily the design has so far not been bought for production.

Leonard Summers also designed 4, the pressure coffee maker. It has a ground base for direct use on a hot-plate but still retains its character as a rich piece of tableware. In production models the base would be in dark anodised aluminium and the top in satin chrome finish.

The silver salt cellar and pepper pot, 5, designed by K. Ling are a rare combination of high technical



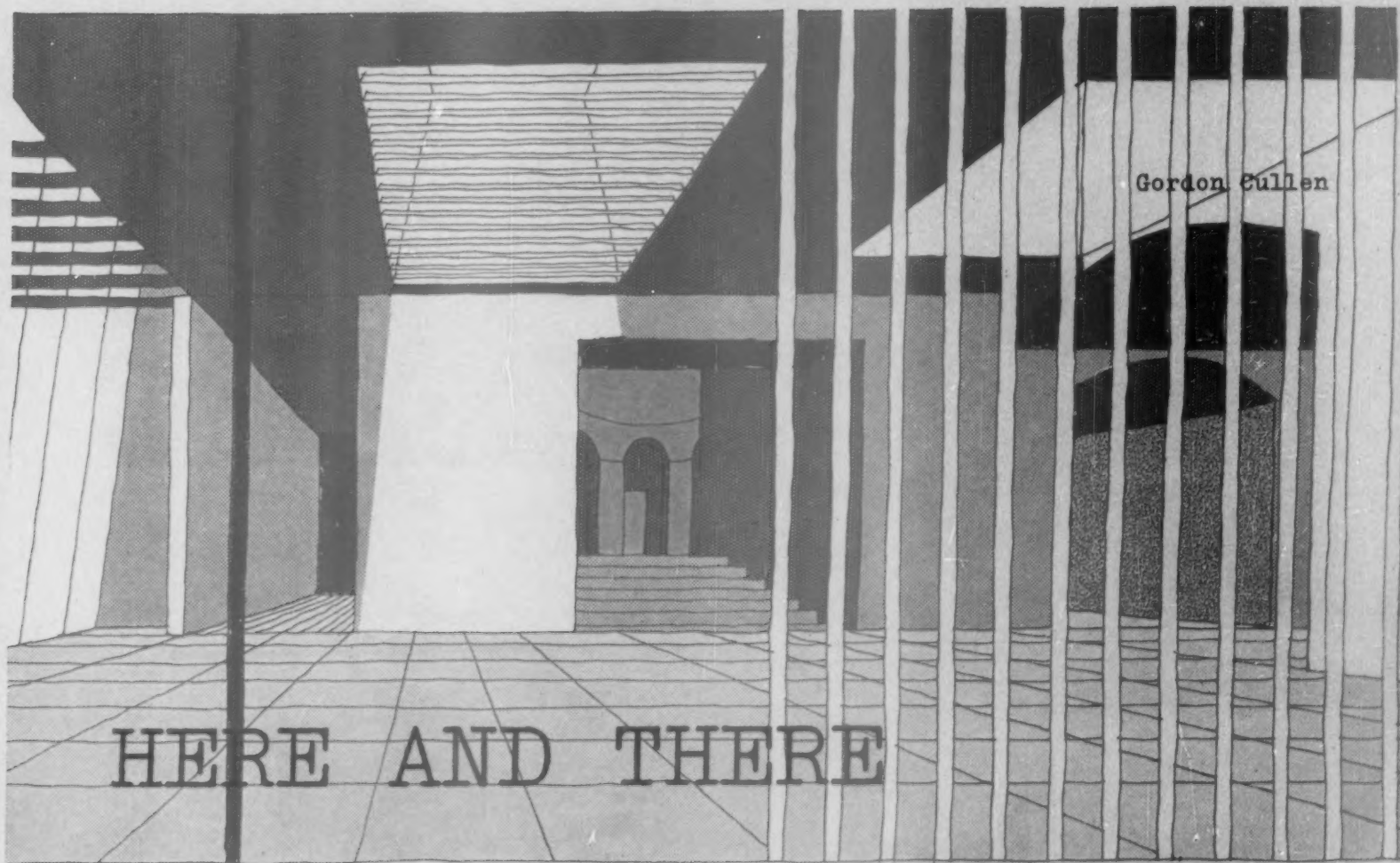
skill and the fresh eye of a young designer. They are worked from seamless tube and sheet metal and have a smooth polished finish. It is disturbing to find no lining to the salt cellar.

The writing desk, 6, is rosewood and dark green leather by M. J. Knott. It is a typically English design which



makes no attempt to be smart for art's sake. This might have been said of the whole exhibition. The emphasis was on quality of design and craftsmanship and was a practical statement of what young British designers can produce given the complete trust of enlightened industrialists.





Gordon Cullen

On a flat plain a house is built. It is an object standing up on the flat surface. Inside the house there are rooms, volumes of space: but from the outside these are not obvious. All we see is the object. Many houses built together form streets and squares. They enclose space and thus a new factor is added to the internal volumes or spaces . . . the outside spaces. Whereas internal volumes, rooms, are justified in the purely functional sense of construction and shelter, there is no such forthright justification for external space—volume. It is accidental and marginal. Or is this so?

In a purely materialistic world our environment would resemble a rock-strewn river, the rocks being buildings and the river being traffic passing them, vehicular and pedestrian. In fact, this conception of *flow* is false since people are by nature possessive. A group of people standing or chatting on the pavement colonize the spot and the passer-by has to walk round them. Social life is not confined to the interior of buildings. Where people forgather, in market place or forum, there will therefore be some expression

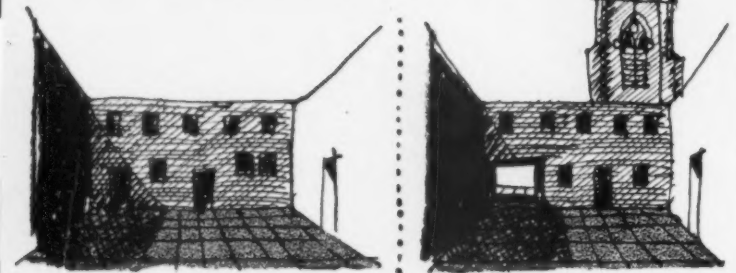
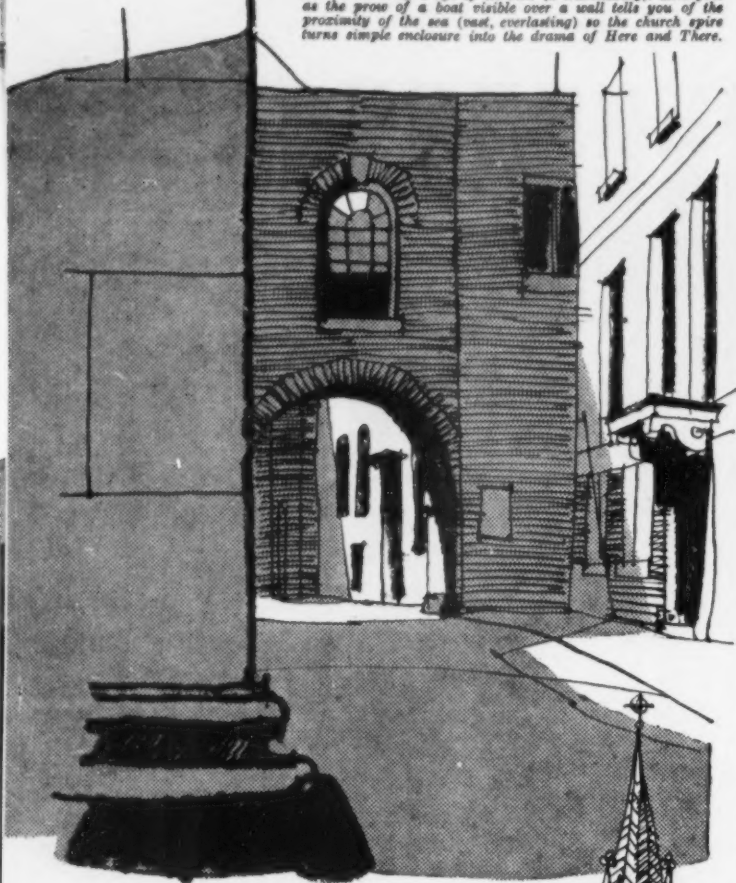
of this to give identity to the activity. Market place, focal point, clearly defined promenade and so on. In other words, the outside is articulated into spaces just as is the inside, but for its own reasons.

We can therefore postulate an environment which is articulated as opposed to one which is simply a part of the earth's surface over which antlike people and vehicles are forever swarming and on to which buildings are plonked at random. Consequently instead of a shapeless environment based on the principle of flow we have an articulated environment resulting from the breaking-up of flow into action and rest, into corridor street and market place, alley and square (and all the minor devolutions of this).

The practical result of so articulating the town into identifiable parts is that no sooner do we create a **HERE** than we have to admit a **THERE**, and it is precisely in the manipulation of these two spatial concepts that a large part of urban drama arises. On the following sketch pages are some points relevant to the employment of space in urban scenery.

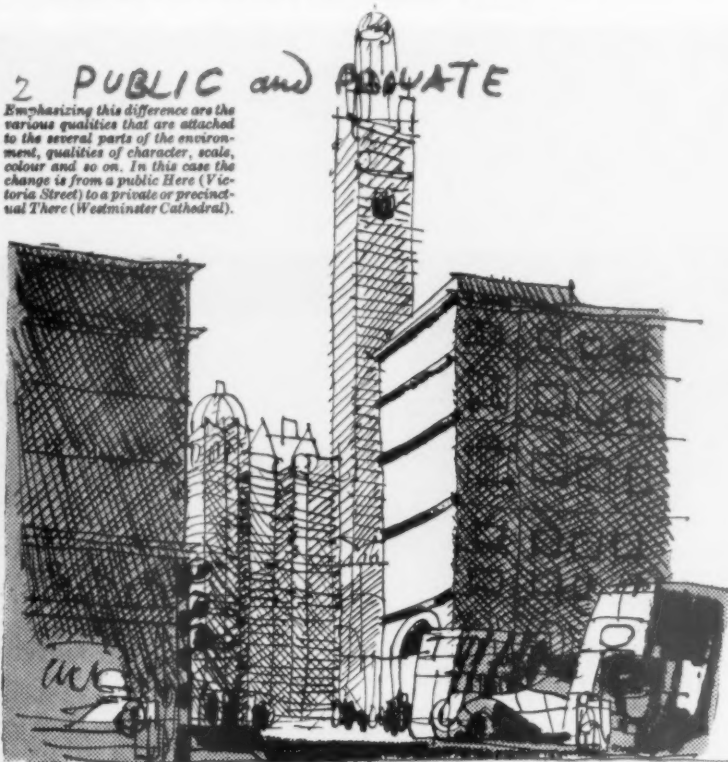
1 HERE and THERE

Man-made enclosure, if only of the simplest kind, divides the environment into **HERE** and **THERE**. On this side of the arch, in Ludlow, we are in the present, uncomplicated and direct world, our world. The other side is different, having in some small way a life of its own (a withholding). And just as the prose of a boat visible over a wall tells you of the proximity of the sea (nost, contrasting) so the church spire turns simple enclosure into the drama of Here and There.



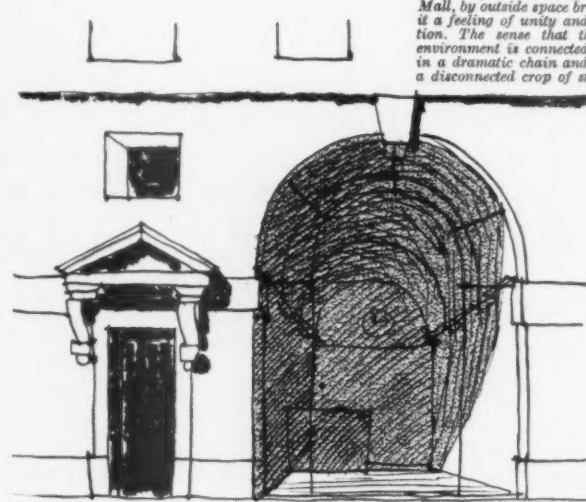
2 PUBLIC and PRIVATE

Emphasizing this difference are the various qualities that are attached to the several parts of the environment, qualities of character, scale, colour and so on. In this case the change is from a public Here (Victoria Street) to a private or precinctual There (Westminster Cathedral).



3 OUTSIDE COMES IN

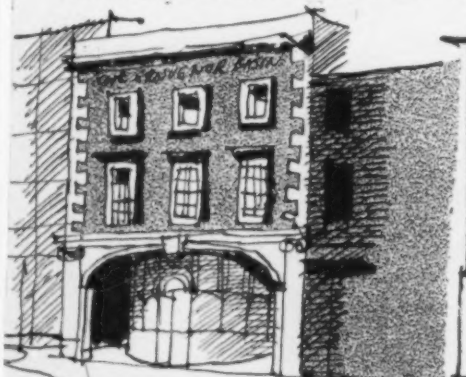
The penetration of interiors, in this case Lutyens' building in Pall Mall, by outside space brings with it a feeling of unity and integration. The sense that the whole environment is connected together in a dramatic chain and not just a disconnected crop of structures.



4 INSIDE EXTENDS OUT

The corollary of this is the expression of inside volumes externally. In the case of the public house, below, the normal street facade is interrupted by the bulge which expresses the function. Again, the section through the shopping street shows how on one side, the left, we simply have shop windows whilst on the right the awnings and costers' barrows

form an enclosure which transforms the whole street from an arid inside/outside statement to a comprehensive and dramatic linear market. To the right, a new building in St. George's Square, S.W.1, demonstrates (by its absence) the value of the spatial link between the porticoes and the trees creating a unified square, not an arid cliff.



Section through shopping street

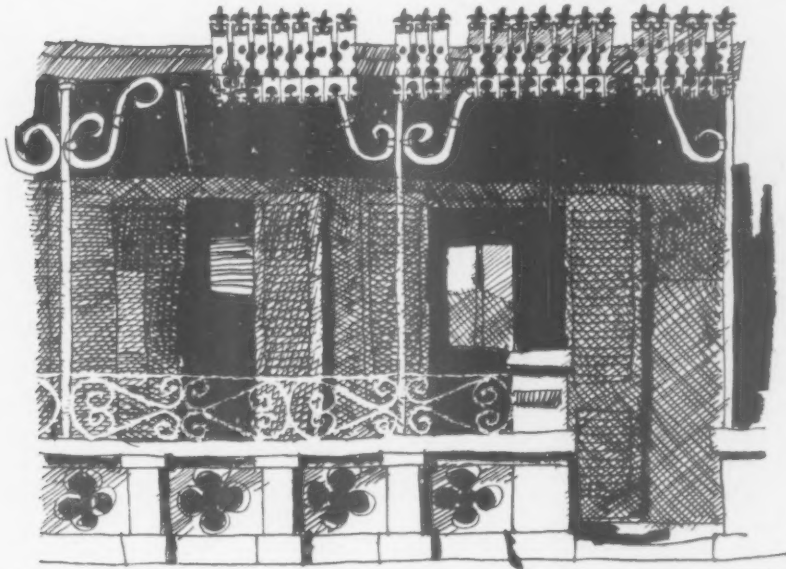
Shop awnings

Costers' barrows



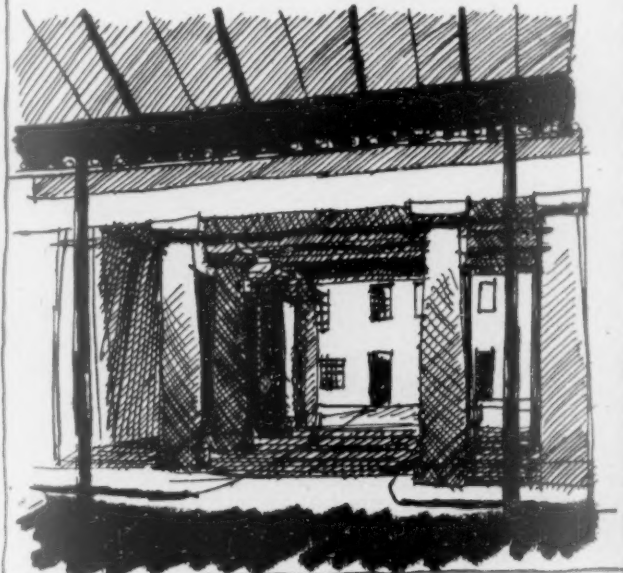
5 CAPTURED SPACE

The carved frets reach out and grip space, the slender rail and posts enclose it, the pierced wall reveals it. Behind, the lowered openings reveal the next dim layer of internal space and the windows complete it.



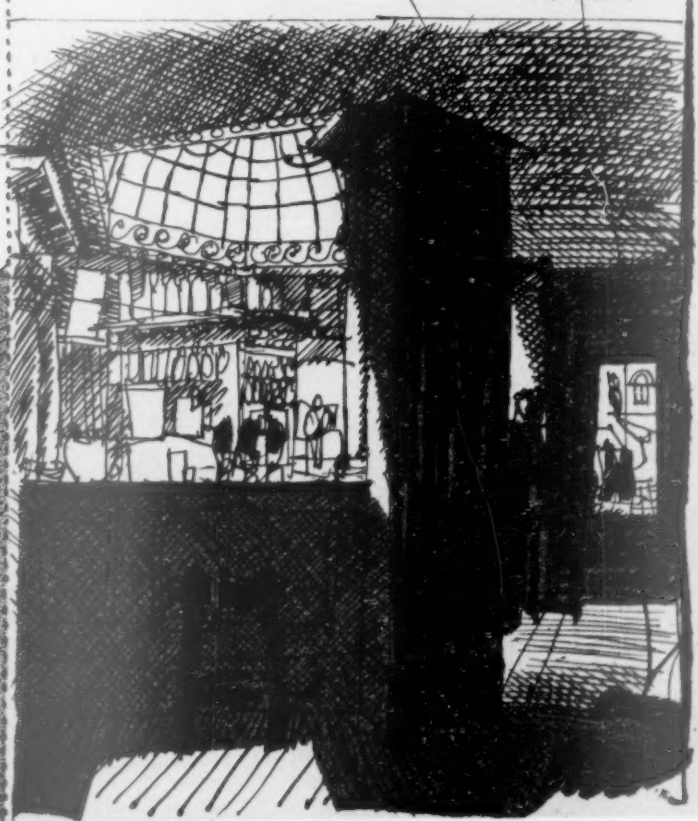
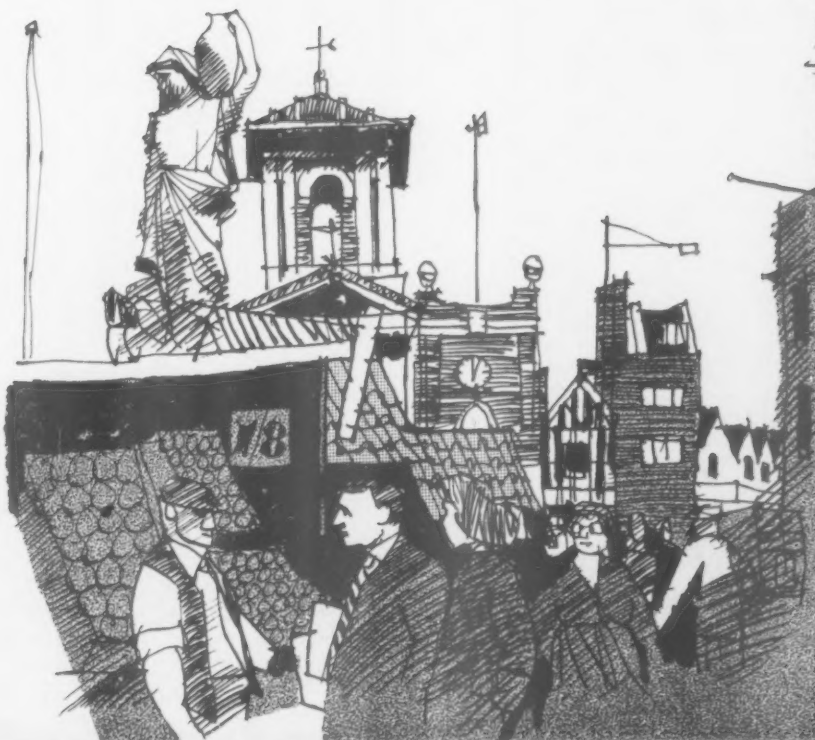
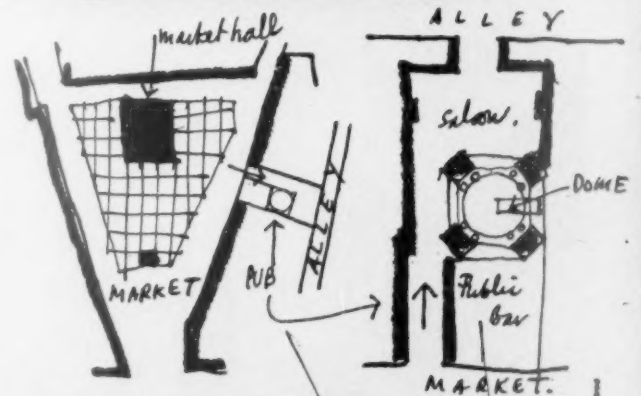
6 SPACE CONTINUITY

Similarly but on a larger scale this view of Greenwich market produces the effect of spatial continuity, a complex interlocking of volumes in which the quality of light and materials denies the concept of outside and inside.



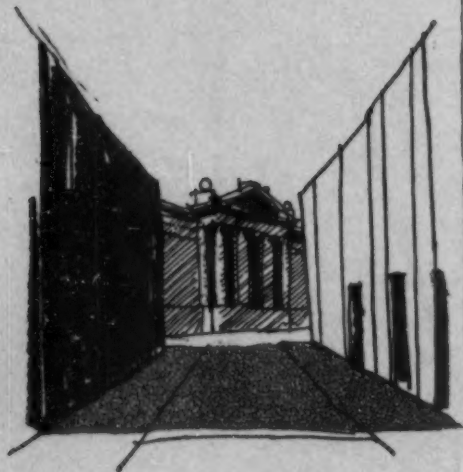
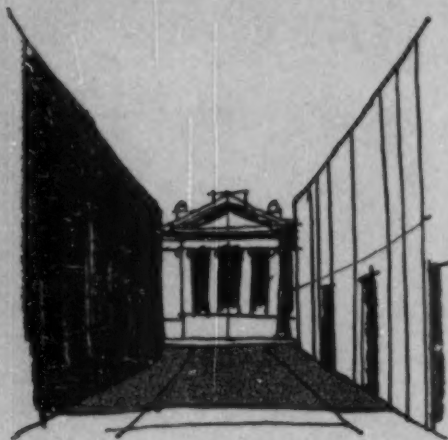
7 EXTERNAL AND INTERNAL

A different aspect of space is shown at Kingston market where two similar spatial systems run side by side. First the Market Square, which is entered by devious small roads, widens out into the busy centre which is heightened by towers and statues. The sky is the dome of this outdoor room. Directly off the Market is the Wheatsheaf Inn which also has a central busy area approached by a narrow corridor. This central area has its own sky, a glass dome. In summer the house is open from back to front and in walking through one is struck by this unity of space-sequence.



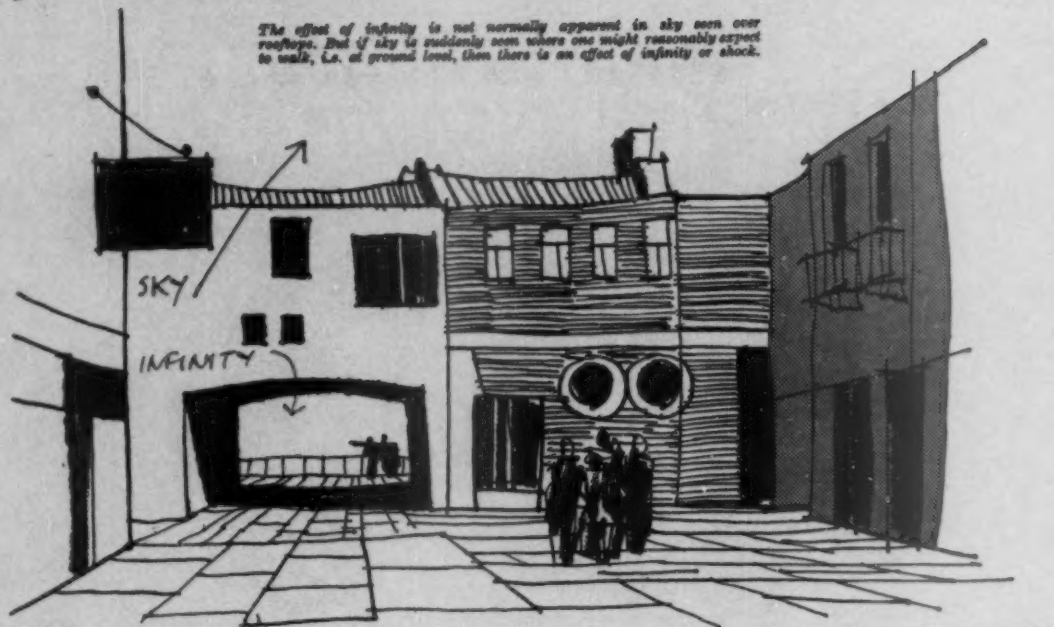
8 DEFLECTION

Where a view is terminated by a building at right angles to the axis then the enclosed space is complete. But a change of angle in the terminal building, as here in Edinburgh, creates a secondary space by implication. A space which you cannot see but feel must be there facing the building.



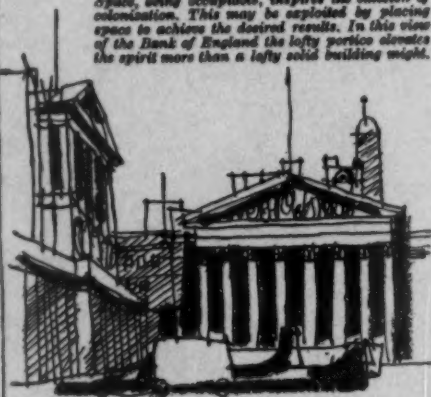
9 SPACE AND INFINITY

The effect of infinity is not normally apparent in sky seen over rooftops. But if sky is suddenly seen where one might reasonably expect to walk, i.e. at ground level, then there is an effect of infinity or shock.



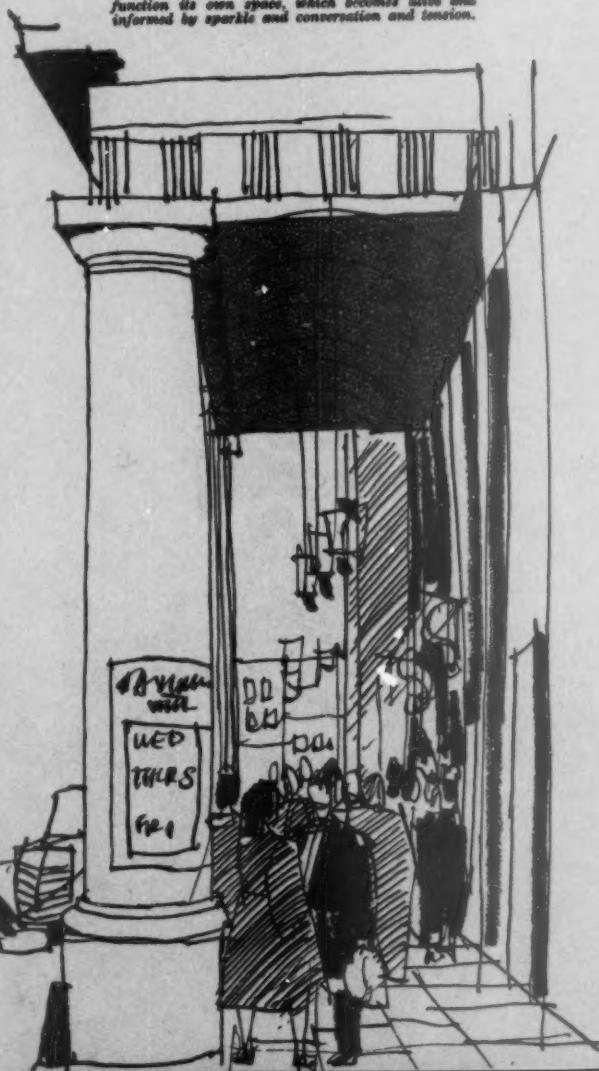
10 PROJECTION

Space, being occupiable, inspires the emotion of orientation. This may be exploited by placing space to achieve the desired results. In this view of the Bank of England the lofty portico elevates the spirit more than a lofty solid building might.



11 FUNCTIONAL SPACE

What better way of emphasizing an event, such as a theatre, in the street than by giving this function its own space, which becomes alive and informed by sparkle and conversation and tension.



12 SPACE RELATIONSHIPS

In this example of the Parade at Cheltenham we see how two spaces, the structural enclosure of buildings and the green enclosure of trees, exist one inside the other. The peculiar spaciousness and quality of this street may be ascribed to the effect of observing the larger enclosure from inside the avenue of trees. This play of identities illustrates Here and There in practice.



current architecture recent buildings of interest briefly illustrated



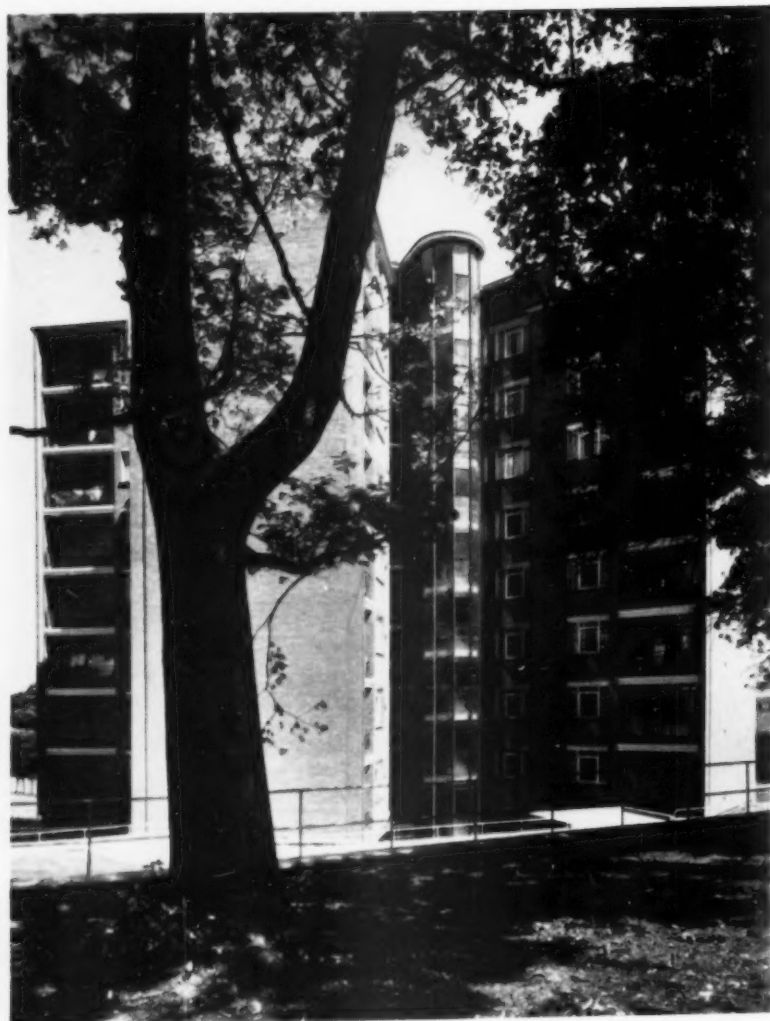
1, a group of houses in the northern corner of the estate.

HOUSING AT PUTNEY

ARCHITECTS: SIR LANCELOT KEAY, BASIL G. DUCKETT AND PARTNERS

This estate for the Wandsworth Borough Council, at West Hill, Putney, is on a site of 19 acres formerly occupied by ten large houses, some of which have been retained and converted. The new buildings are set informally among the trees and slopes to give interest and seclusion in a development which will eventually have a density of 100 persons to the acre. The first two stages, totalling 276 dwellings, are

now complete, with houses set round a large green, and four and five-storey blocks of flats and maisonettes. Nine-storey point blocks with wide views over London have four flats per floor, served by one staircase. The houses and maisonettes have solid fuel fires with back boilers and immersion heaters. The point blocks have gas fires and gas multi-point water heaters.



2

Housing at Putney



3

- 2, one of the nine-storey point blocks with curved staircase window.
 3, stepped terrace of three-bedroomed houses.
 4, another view of a terrace with details of the gable walls.



4



site plan

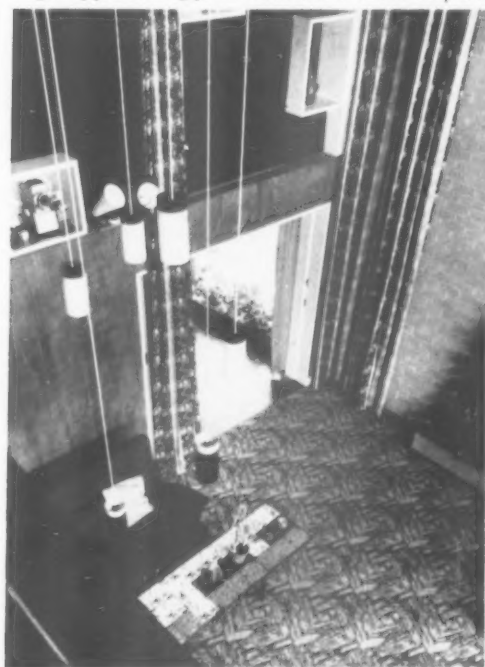


5, the front door, with car port to the right.

HOUSE AT STRATFORD-UPON-AVON

ARCHITECT: DENYS HINTON

6, looking down from the living-room balcony; experimental lengths of fabric hang from double tracks round the room.



Sited on the outskirts of Stratford, the house was designed for a manufacturer of furnishing fabrics. The two-storey part has $4\frac{1}{2}$ in. brick cross walls with storey-high prefabricated softwood panels, glazed full width and incorporating sliding doors and pivoting windows, with

House at Stratford-upon-Avon

iroko boarding between. The brickwork at the south-west end is returned on both sides to form a U-shape, providing longitudinal stiffening to the structure. The roof of dark interlocking tiles has a 30° pitch. The ground floor is planned round the entrance hall and kitchen, with the formal entertaining area on one side, separated from the hall by a sliding glazed partition, and on the other the 'family area.' Heating is by under floor electric storage using PVC covered cable.



7, the house from the entrance drive.



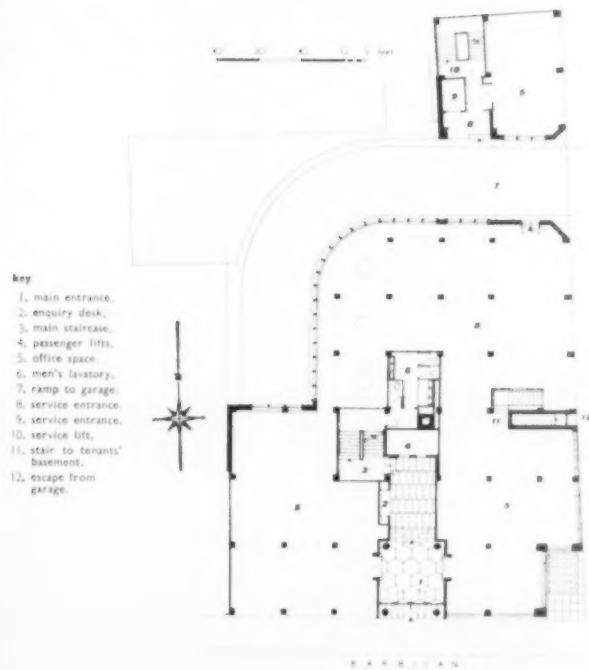
8, view from the bombed site south-east of the offices.

OFFICES AT BARBICAN, E.C.1

ARCHITECT: FRANK SCARLETT

This block of offices, Murray House, on the north side of the Barbican, was designed for letting either as a whole or floor by floor. The plan was determined by the need for flexibility and easy subdivision internally as well as by the planning authorities' requirements. The super-structure is steel frame on a reinforced concrete basement;

the cladding is natural Portland stone, with artificial stone mullions and spandrel panels. The windows are aluminium. Floors are of precast concrete units, finished with plastic tiles or terrazzo. The main entrance has Verde Antico marble walls and columns cased in white marble mosaic.



9, the board room.



The name *miscellany* implies, of course, an architectural miscellany—one that will include subjects which, though marginal to architecture, are nevertheless vital to it.

miscellany

BOOKS

GILT COMPLEX

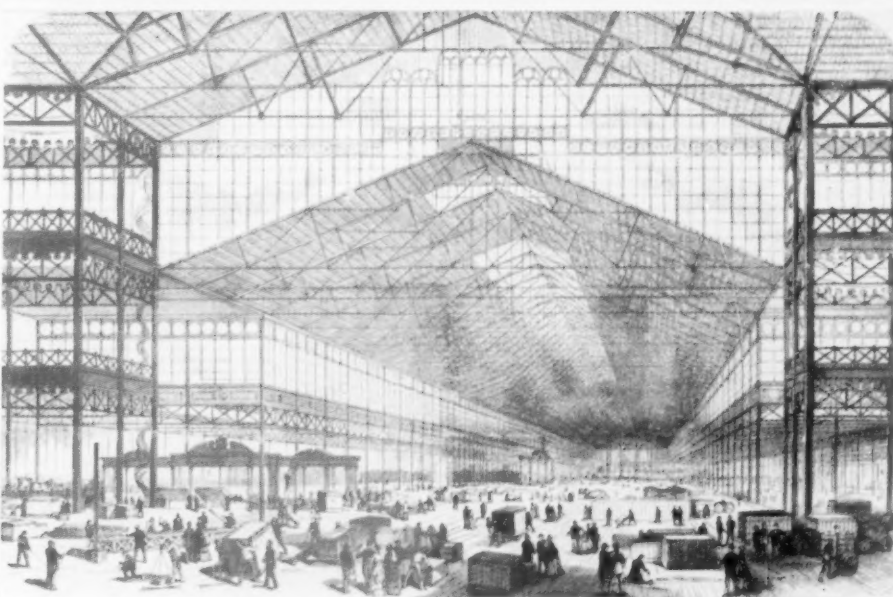
THE GINGERBREAD AGE, John Maass, Rinehart, 1957. \$7.95.

HERE LIVED THE CALIFORNIANS, Oscar Lewis, Rinehart, 1957. \$7.95.

The Gingerbread Age is a delightful book; it is impossible to stop looking at the pictures. Photographs of nineteenth-century American architecture are common enough, fortunately surviving when the buildings are swept away, but these are particularly good, and the ones taken by Mr. Maass himself with a minimum of false glamour from red filters have the rare quality of looking like buildings; most photographers see a good piece of architecture and immediately begin crawling along on their bellies or climbing trees to get a cunning angle, composing away until the architect's composition is lost in their own. Here, the impression is that we have just pushed open the gate and started to walk up the path.

It is standard comment that Americans have a shorter past than Europeans, and that they therefore regard newer things than we do as antique. Certainly American antique shops sell things that in England would only have got as far as shops called Bric-a-Brac or Treasure Trove, but nineteenth-century American architecture has curiously not benefited from this short past to the same extent as the objects and furniture. It is

Gilt complex: 1 and 2, the extremes of American Victorianism, a New York interior of the eighteen-fifties, and the Philadelphia Centennial Exhibition building of 1876; 3 and 4, fancy tops and standard bodies. 3, uniforms of the New York Police, and 4, housefronts as seen by Saul Steinberg.



pulled down, especially in the cities, with a fervour even brisker than our own.

Few authorities have the sense and taste to protect good gingerbread in either England or America, so that its champions, worn out by the battle for preservation, often lose their heads as badly as the worshippers of earlier styles, and admire anything if only it is ornate enough; all gingerbread becomes good gingerbread to them. Mr. Maass avoids this trap with the greatest ease; there is hardly a

picture included that one would question, and so it is ungrateful to query omissions—we must hope that he has only left out such things as the splendid castellated armouries of New York so that he can devote a whole book to them in future.

Mr. Lewis' book is quite different. The same publisher has produced it, much less attractively, with mean type and a thin grey air. The writing is full of pomposities, clichés and inversions; it may be argued that spe-

cialists do not necessarily make good writers and that this is unfair criticism, and so it would be if Mr. Lewis had collected some excellent photographs and told us the relevant facts accurately, but he has not done this, and there are infuriating errors, unforgivable in a dull book.

An incomprehensible book, too. It is clearly popular in intent; why, then, dismiss the gigantic fantasy of the Winchester House with one dim old photograph? There are much better ones to be found.

However, what Mr. Lewis really likes is the architecture of the turn of the century, 'a period when there arose a group of mansions that in size, design, and in the elegance of their furnishing set standards unequalled either before or since . . . an impressive group of residences . . . in their design closely following European models of the best periods; namely, those of the French and Italian Renaissance, eighteenth-century English manor houses, Spanish haciendas, and the picturesque villas of the Mediterranean coast.' Well.

Barbara Jones

DUTCH MILLENNARY

DUIZEND JAAR BOUWEN IN NEDERLAND VOL. II by Prof. ter Kuile, F. Andreae and R. C. Hekker. Alert de Lange, Fl. 27.50.

Thinking of those who want information on the history of art and architecture in their own country without being specialist scholars, how lucky the Dutch are. They have the *Kunstgeschiedenis der Nederlanden*, an up-to-date one-volume work written by a dozen of the foremost experts; they have the beautiful volumes of *De Schoonheid van ons Land*, large quartos of Phaidon character including Dr. Gerson on Dutch painting (two volumes) and Dr. Ozinga on Dutch medieval churches (two volumes). Dr. Ozinga and Professor ter Kuile are the two leading architectural historians of Holland, both unparochial to an extent attainable only in small and highly civilized countries. To understand Dutch architecture, one must be thoroughly familiar with France as well as Germany and at least have some knowledge of Britain and Scandinavia as well.

Professor ter Kuile's contributions to *Duizend Jaar Bouwen in Nederland*, of which the first volume came out in 1948 and the second in 1957, are an exemplary illustration of this virtue. Looking at Holland from across the Channel two periods must interest us specially: the later Middle Ages and the first half of the seventeenth century. In the first case the connexion is on the secular side only, in the second it refers to churches as well. The dependence of one of Wren's plans for city churches on the New Church at Haarlem is well enough known, the dependence of the Hugh May type of brick house with a hipped roof and giant pilasters on van Campen, Post and especially Vingboons is equally familiar. A travel pass was granted to Hugh May in 1656 to cross over to Holland. The Colchill type of house also has Dutch precedents. Its balustrade, hipped roof and belvedere lantern are illustrated by Professor ter Kuile in a Dutch example of 1637 (Elsenburg by Philips Vingboons).

As regards relations between Holland and England in the late Middle Ages, these are more on the vernacular side and, at the level below that of the manor house, would deserve more study. *Duizend Jaar* will in this respect also be extremely useful. The two volumes are published in the Heem Schut Library, which is a series of books dedicated to the preservation of rural Holland and of ancient buildings in Holland, and so place quite unusual emphasis on the development of the cottage on the one hand, the town on the other. Professor ter Kuile has 350 pages for architectural history, Mr. Fockema Andreae over 200 for the history of town and village, Mr. Hekker over 100 for cottage and farmhouse. This is an interesting apportioning of space and one that ought to encourage the few in this country who concentrate on village and farmhouse types to come out into the open and establish their position side by side with the historians of town planning and major architecture. Mr. Hekker's chapters are a pattern of how the problems of the farmhouse can be presented intelligently and intelligibly.

There remains only one criticism, and this may be caused by the publisher or by Professor ter Kuile. His history of Dutch architecture stops about 1870. No Cuypers, no Berlage, no De Stijl, no de Klerck and Kramer. Surely fifty years are a long enough stretch of time to make events history.

N.P.

EMPEROR OF EUROPE

FREDERICK II OF HOHENSTAUFEN. By Georgina Masson. Secker & Warburg, 35s.

Few rulers have possessed talents comparable to those of the Emperor Frederick II. Not only their quality but their range was astonishing. An inspired administrator, a skilled diplomatist, a competent general, he struggled ceaselessly to create a unified European state, an effective Holy Roman Empire. In the circumstances it passes belief that he should also have been a patron of learning, founder of the University of Naples, an Arabic scholar, a gifted mathematician, the author of a standard work on falconry, a poet whom Dante regarded as the father of Italian vernacular verse, and not least a Renaissance prince two hundred years ahead of his time. It is moving to consider the intellectual isolation of this thirteenth-century potentate, collecting antique sculpture and excavating the tomb of Galla Placidia. No wonder Matthew Paris called him the *stupor mundi*.

Unfortunately the Emperor's vices were almost as remarkable as his virtues. His extreme cruelty and duplicity would have distinguished him in any age. Thus his career poses in an acute form the puzzling separation of the Great and the Good, and history inevitably points the contrast with his contemporary Saint Louis. Yet it is ironic that the things which make us uneasy about the astonishing Emperor, and which would certainly have worried our more scrupulous grandfathers, gave his contemporaries little pause. The Christian society of the time seems to have been morally unperturbed by the webs he spun or the tortures he inflicted. On the contrary the Guelph half of Europe was

shocked by the very qualities that we admire. It was not the blinding of Pietro della Vigna, who had served him well for thirty years, but his passionate desire for knowledge, his humanistic bent, his interest in Islamic society, and perhaps not least his scandalous habit of taking a daily bath which, in the thirteenth century, spelled his downfall. With Frederick's failure, the Imperial idea, the conception of a unified European state, failed too. Today, as Europe painfully struggles towards a belated unity, it is curious to speculate on what was lost seven hundred years ago.

In *Frederick II of Hohenstaufen* Miss Masson brings out well both the complexity of the Emperor's character and the immense issues that were at stake in his struggle with the papacy. Though her style is sometimes undistinguished, it is a readable and enlightening biography. As an expert on the Swabian castles of southern Italy, Miss Masson is particularly interesting on the Emperor as architect. He had clearly studied Crusader and Saracen architecture in the Holy Land, and building was but another of his occupations. With certain of his castles, such as Castel del Monte and Lagopesole, incomparably set in wild Apulian landscapes, Frederick II perhaps remains most happily associated. It was to such castles that he retired with his friends and harem, his books and statuary; there that he wrote verse, disputed with mathematicians and philosophers, and in the surrounding country that he indulged his love of birds and animals, and practised the falconry of which he was the outstanding exponent. It was a Renaissance way of life which must have struck his contemporaries as extremely odd.

Robin Fedden

Shorter Notices

Roberto Aloï. ARCHITETTURA PER LO SPETTACOLO. *Esempi series*, Hoepli, Milan, 12,000 lire.

Hoepli's *Esempi* started out as modest little paper-backed quartos (the first, on chairs, is probably one of the most influential books of the nineteen-fifties) that sold for under 2,000 lire. This latest one is a massive, lavish, reference library tome at a reference library price, and covers theatre buildings in the widest possible terms. Historically it reaches back to ancient Greece, technically it stretches from open-air auditoria to drive-in cinemas by way of television studios, geographically it brackets Helsinki, Caracas and Tokio, scenographically it ranges from Palladian illusionism to collegiate arenas. Many of the examples will be unfamiliar to English readers, and some of them will repay close study—particularly the Japanese theatres for western-type entertainments, which (as is so often the case with such collisions between East and West) seem to inflate the least graceful and least thought-out routines of Western architecture into awful warnings on a monstrous scale. More reassuring, in many ways, are the various attempts to get behind the picture-frame proscenium and throw the basic ritual of the drama into the laps of the audience, most ingeniously in the minute Teatro Sant'Erasmus in Milan, most flexibly at Orange Coast College (California), and with most classic grace in the Teatro Verde on the island of San Giorgio Maggiore, Venice.

Q.S.C.



Palladio wallpaper "Pavilion" No. 44322. Drawing by Jane Shannan. For the second year running a Palladio wallpaper has been chosen as one of the best designs shown during the year at the Design Centre.

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The primary purpose of our ARCHITECTS' DEPARTMENT is to give advice on the use of wallpaper, but we welcome inquiries relating to the interior scheme of decoration as a whole.

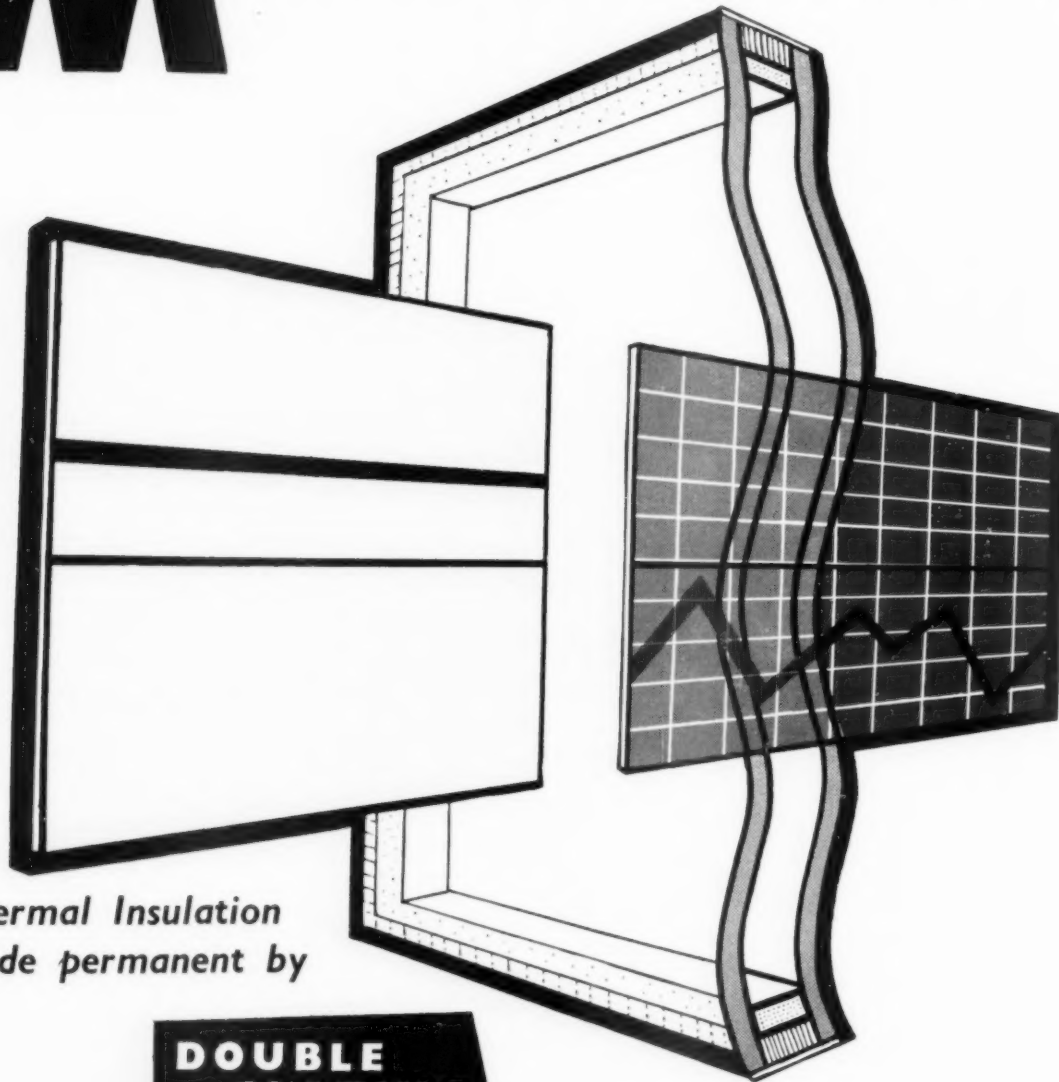
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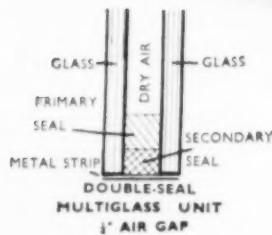
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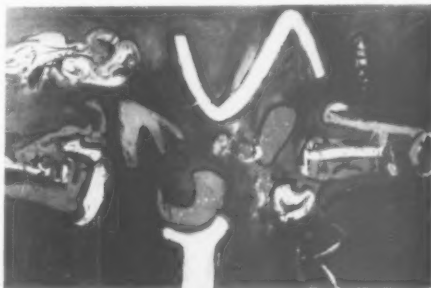
PAINTINGS

Last month I called Alan Davie a master of the enveloping image, but I forgot to mention that I was going by a single example, which has now been dismantled. I don't know how many works by Davie have to be brought together to make an enveloping image. It raises a nice problem for collectors who want to possess pictures which represent him at his best: there have never been quite enough canvases in his one-man shows at Gimpel Fils to stop one wondering what he is up to, but his Whitechapel retrospective was so thoroughly enveloping that he could probably bring one to a state of mental, moral and spiritual subjection with rather less than the fifty or so large oils that he used there. Since then, Davie has contributed small groups of medium-sized works to Sylvester's Choice at Arthur Tooth & Sons and the Gregory Fellowship show at the ICA, and although their characteristic air of being brilliantly unsuccessful demonstrations of the proposition that the artist must destroy in order to create provided a far from misleading sense of his brinkmanship, they could not convey the faintest idea of the magnificence of the transformation scene at Whitechapel, where all the pictures went over the brink together, like a con-course of fallen angels, and took the spectator with them. If it were not for the fact that more and more people are becoming incapable of interpreting metaphors, the exhibition might have been a great popular success, for it presented a dazzling caricature of the sense of glory and an all-pervading image of those aspects of human behaviour that are governed by the craving to be 'sent.'

I have had only one previous experience of the enveloping power of pictorial images that was in any way comparable to my experience at Whitechapel. It was when I was pouring over a reproduction of Hieronymus Bosch's Lisbon triptych of 'The Temptation of St. Anthony,' and suddenly realized that I, too, was being tempted by the brutal and ridiculous monstrosities parading before the Saint: at that point the Saint himself became suspect, and I began to think of him as a virtuoso of brinkmanship who would be drawn night after night into the self-induced excitements of not quite falling.

Bosch had to undertake a clinical examination of his own corrupted animality before he could devise an imagery of temptation that would be understood by all men. Davie's approach, on the

other hand, seems to involve a good deal of automatism, and he has more in common with some of the Christian Ecstasies than with a subtle psychologist like Bosch. He himself says that he *thinks* he paints 'simply to find enlightenment and revelation,' and that during the act of painting he is aware only of 'a striving, a yearning, the making of many impossible attempts at a kind of transmutation.' It could be deduced from this statement that it is the paint itself that he is trying to transmute, especially since he mentions that he feels very close to the alchemists, but in fact it is his knowledge of certain aspects of contemporary painting that he is trying to transmute, and at Whitechapel it was



quite startlingly evident that he takes an obsessive interest in some of the forms and compositional devices of Sutherland and Miro. But he certainly does something to them. He thickens them and gives them, so to speak, more fluid and an air of being fascinated by their own swollenness. In the painting called 'First Movement in Green,' 1, there are forms



which are reminiscent of Miro, Sutherland and Matta, but they have acquired more substance and a more compulsive wriggle; and in the middle panel of the large, chaotic, almost indecipherable triptych which he calls 'The Marriage Feast,' 2, his 'striving and yearning' takes an undisguisedly orgiastic turn. At Whitechapel, one felt that the desperation of the senses had found an outlet in a sustained if unedifying pullulation. One was in a world of excitement and gratification; the same world of sensation that Bosch's St. Anthony perceived as undiluted evil. So perhaps it's a good thing that a large permanent collection of his work has not yet been formed. I only say *perhaps*.

The Goanese painter Francis Souza, who settled in London in 1949, has been steadily rising to a position of consequence in contemporary English painting. He dominated the interesting exhibition called 'Seven Indian Painters in Europe,' recently held at Gallery One, and it is clear that the other exhibitors have treated his work as a guide to the art of becoming Euro-



peanized. One or two of them merely reflect his highly personal idiom, but others have looked at him more knowingly; they have gone back to some of his own sources and are trying, not without sensibility, to digest the influence of Klee or Colquhoun. Souza's imaginary portraits are the most formidable caricatures of the human countenance that have appeared in English art since Wyndham Lewis's tyros. They are not, however, motivated by satire, and arise from the desire, peculiar to primitive tribesmen and twentieth-century artists, to create bogymen.

Souza does it very well, and the over-weening presence called 'Elder,' 3, which is less oppressively dark in colour than most of his figure paintings, is among his best achievements. In his paintings of archi-



teetural subjects he applies precisely the same design formula as for his portraits and as can be seen from his 'Church in Hampstead,' 4, he even employs the same decorative detail; but the colour is usually richer, and his blues and reds outlined with black aspire too obviously to the luminosity of stained glass.

Robert Melville

WORLD

VENEZUELAN NEWS LETTER

Venezuela, the Little Venice of South America is no longer little; the present population-boom has made it the fastest-growing country in the world, with its census rising at the unprecedented rate of five per cent per annum. But this increase is not dispersed over the whole country—the capital, Caracas, has trebled in size in fifteen years, while migration from Europe and rural de-population together have produced a situation where four-fifths of the Venezuelans live in one-fifth of the country.

This misdistribution of people has inevitably brought problems, chiefly that of lack of housing, but once a city like Caracas has reached its present excessive size there can be no ideal solutions, only compromises—good or bad. Some measures were taken, some time back, to relieve population pressures, and the new economy of Venezuela, based on petroleum and the minerals of the Orinoco, has made their implementation possible, and the solution to the housing problem of Caracas has the unusual merit of having been put into

practice already, 1, rather than put off until better times.

The basic aspects of the problem are the familiar ones of creating new housing and replacing what has become obsolete, but the fully integrated planning approach practiced in Caracas has succeeded, so far, in doing both without creating new slums or precipitating further mass-migrations into the city area. The financial problem was taken in hand as long ago as 1928, with the foundation of the *Banco Obrero* (Workers' Bank) which advances building-loans to lower and middle income tenants—up to \$10,000 at 4 per cent over thirty-three years. The Bank works closely with the National Commission for Urbanism and now has its own Architects' Department; among its most distinguished housing projects are *El Silencio*, of 750 apartments, and the *2nd of December*, 2, with 9,000. Each is a fully equipped community with such subsidiary buildings as shopping centres, kindergartens, churches and places of entertainment.



1, one of the first housing schemes in Caracas.
2, blocks of flats financed by the Banco Obrero.

All such projects depend upon a Four Year Plan, and a four-way breakdown of the finance involved, as follows: the land is given by the municipality, the streets and their lighting by the Regional administration, the utilities by the Ministry of public works, and the housing, as mentioned above, is financed from the Banco Obrero. Four general principles govern the design of the accommodation: sanitation has high priority; the plan breaks down into three zones, for sleeping, working and living; units must have an estimated life of at least thirty years; but the roof may be treated as an experimental structure and must be replaceable. In addition, the Bank conducts some experimental building of its



3, typical flimsy shacks which are being replaced.

own in order to investigate design problems.

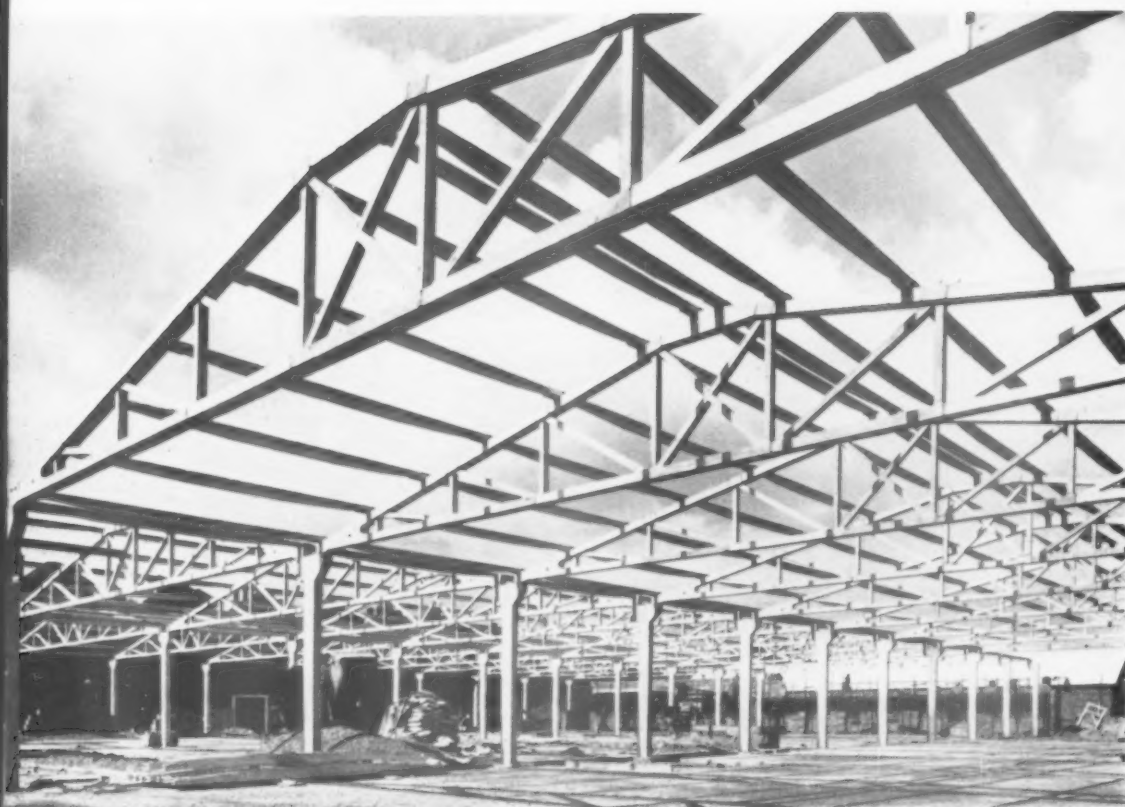
The clearing of the *Ciudad Tablitas* (shanty towns) present no difficulties, because the shacks are so flimsy, 3, and a nominal price is given for each shack in lieu of a down-payment. But great care is taken not to demolish the family at the same time, and much time and thought has been devoted to the psychological problems of transferring families from one environment to another. Anti-social patterns of behaviour are slowly reformed, advantageous ones are encouraged and much of the disorientation and hostility that used to accompany upheavals of this kind can now be avoided. New communities shake down with surprising ease into their new surroundings, not only because they are well designed, but because they are designed to house communities as going concerns with all the structures and public spaces that community life demands, 4 and 5.

Because of this socially and psychologically sensitive approach, Caracas has an unmatched record in the rehousing of lower and middle income groups, and it is worth noting that it depends, to some extent, on a cultivation of Venezuelan traditions. Thus, Dr. Carlos Raul Vil-



4, the plaza of the 2nd of December area, showing 4, the church and 5, the market.

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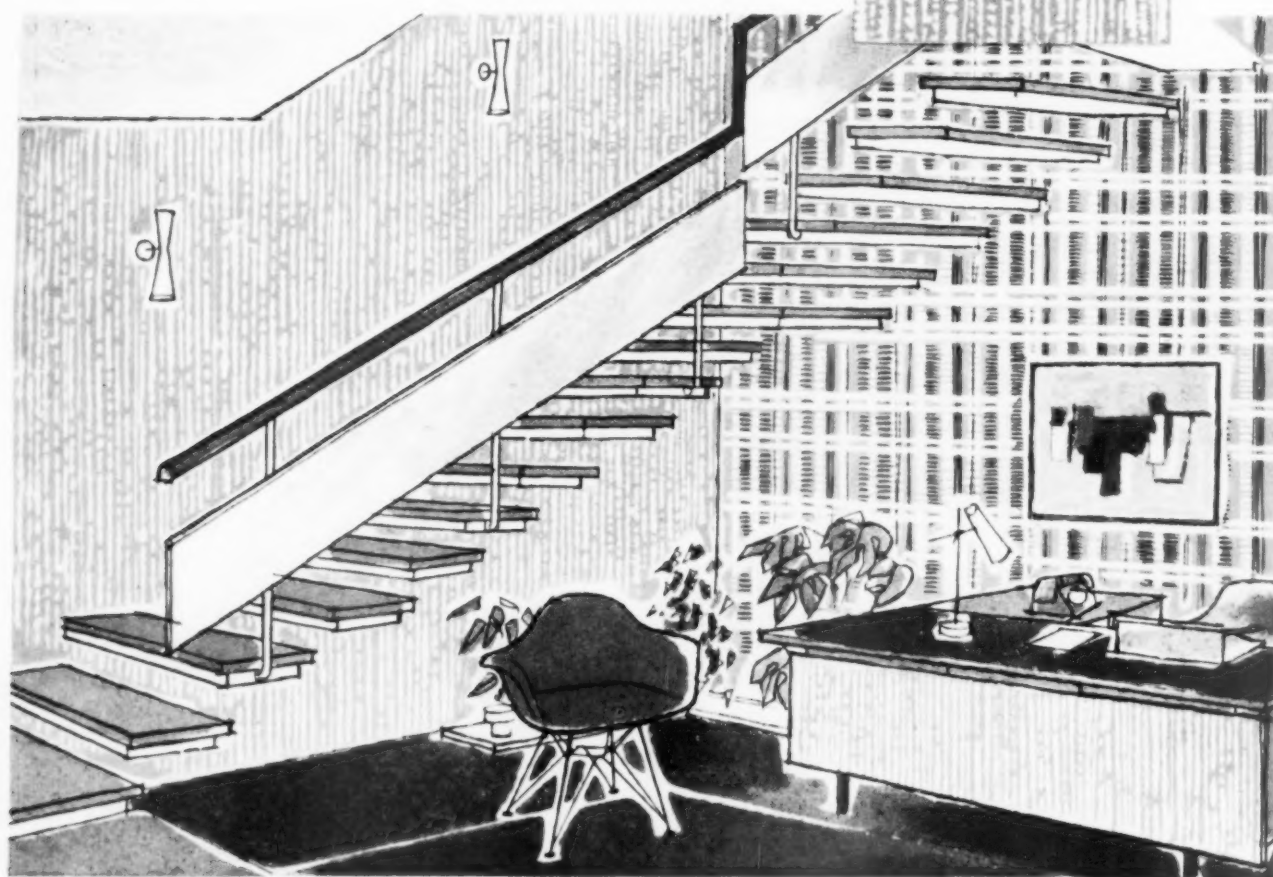
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Immevia, one of the architects of the 2nd of December project, has paid tribute to the importance of the piazza in early colonial Venezuela, and has tried to re-create its functions in order to free pedestrians from the constant menace of the automobile, and preserve a human scale on the often dramatically-terraced sites of these recent developments. 6.



6, a view from the centre of the 2nd of December project, looking east towards the mountains.

No doubt there are faults in such projects—often caused by hurried construction and poor maintenance—but they have an important lesson to teach in their way of uniting all classes of society in the common purpose of a better life for all. If their lessons were more widely understood, Le Corbusier's complaint that our cities are not worthy of us might become only a quotation remembered from the past.

Janez Hacin

LA TOURETTE

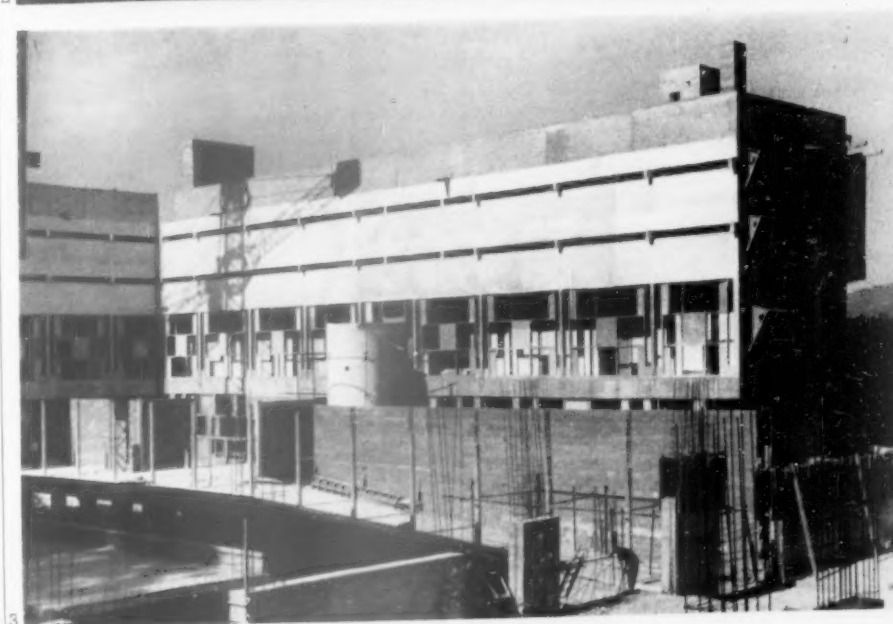
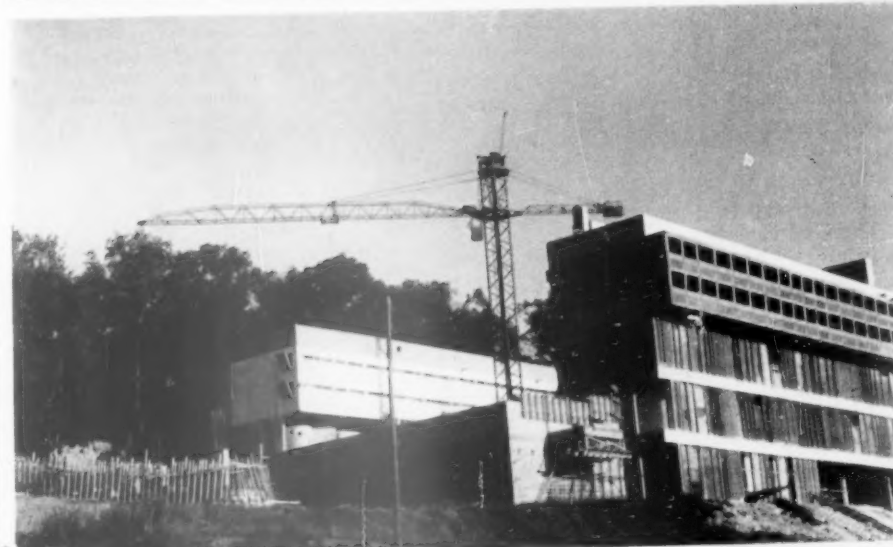
With the friary at La Tourette approaching completion, it becomes possible to form some idea of the architectural quality of this, Le Corbusier's second major religious building. Quite apart from the handling of the details (which are shown on the frontispiece to this issue, page 284), the removal of most of the scaffolding gives a clear view of the relationship of the details to the masses, and clarifies the relationship of the masses to the magnificent site. 1.

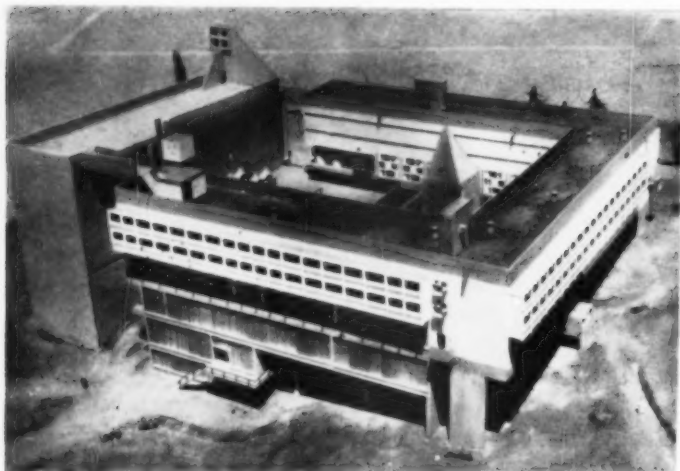
The whole structure is now seen as being backed up against a bank of trees, 2, that seals off the top of the sloping meadow on which it stands, and is, in fact, part of an avenue leading back to an old chateau. The 'Nantes' type balconies which serve the two tiers of cells that run round the top of the main buildings on three sides of the central cloister will, on that side, give directly on to the trees, but on the

1, the nearly-completed monastery of La Tourette standing on its hillside site.

2, the northwest corner, showing the base of the incomplete chapel in the foreground.

3, a view from the chapel floor into the internal cloister, with walls of circulation corridors in the course of erection.





1, a model of the monastery of La Tourette as it should appear on completion of Le Corbusier's design.

other two sides will command enormous views of the valley below.

Comparison of 2 with a view of the model 4, shows that the block containing the chapel, which is to close the fourth side of the square, is—as yet—only up to the level of the chapel floor, and 3 reveals that although the walls of the complicated circulation corridors in the bottom of the cloister-well are fairly advanced, their layout seems to diverge from the plans that have been published so far.

The final completion of this fascinating building is awaited with the keenest interest by all who are interested in *le cas Corbu* because—unlike Ronchamp—it offers a precise and detailed functional programme, based on the rules of the Dominican Order, and will thus lend itself to point by point evaluation, as well as the 'holistic' or 'total gestalt' approach needed for Notre Dame du Haut. Q.S.C.

COUNTER-ATTACK

A VISUAL DEVELOPMENT PLAN

For any amenity society prevention is very much better than cure. If the character of a place can be established and described on paper so that it becomes something as tangible as a by-law condition, the chances of this are very much greater. This ought to have been done by the planning authorities in their development plans—but, apart from a very few exceptions, the development plans are statistical equations which bear no relation to the look of things. A visual development plan can still be produced as a private venture, however, and this has been done by Peter Beresford, of the Fareham branch of the CPRE, for the two-mile-long stretch of Solent coastline called Hill Head. It is a very good report—especially as Hill Head has no obvious attraction other than its remarkable view over the Solent from the top of the low cliffs: extracts are

printed below so that readers can judge for themselves.

Once a document like this is in print (it has been circulated to all the local officials concerned), the planning officer knows what the attitude of the amenity society is, the society has the authority of some paper work behind it with which to impress the legally-minded at Council meetings and public inquiries, and, perhaps most important of all, the amenity society knows just *why* it is opposing or trying to influence a new bit of development. Such a survey could well be the first job of a new society; and if there is disagreement on visual matters it is far better that it should be hammered out early and privately, rather than later and in public to the amusement and advantage of opponents. The report follows the coast road from south to north and each part with a different character is treated separately: it shows, incidentally, that the Counter-Attack principle of separating out the parts of the environment is practicable even when applied to small and subtle changes of scene. I.N.

Extracts from report on Hill Head for the Fareham Branch of the CPRE.

The Salterns

A wide bank of shingle, a strip of marsh, and the road part way up a low, hummocky cliff. This stretch forms a barrier which defines Hill Head and stops it becoming a part of Lee-on-Solent. This is important because the two places have quite distinct personalities and such distinctions must be emphasized if the world is not



1, the road above the Salterns—still a country road done country-style. New houses are all set back behind the earthen bank on the right hand side.

to descend to dreary monotony. The one thing about the Salterns which should be kept at all costs is, therefore, the effect of untouched openness.

New houses set back from the top of the cliff are well placed and cause very little disturbance. 1. Huts set right out on the shingle bank, 2, on the other hand, are a very great disturbance and should be moved back under the shelter of the cliff, like the ones in Cliff Road are.

Hill Head Road (a)

Closed in and shut off from the sea by trees and houses, the contrast with the open cliff tops serves admirably to pinpoint this as the centre of the village. There are also wonderful dramatic effects produced by houses set with their roofs at road level, facing the sea, 3. The thing which is important about this particular place is the sense of enclosure and shelter and any new development should perpetuate this.

The buildings are not particularly distinguished but they are made interesting by being seen a bit at a time, which is done by setting them close to a winding road and mingling them with trees and high hedges.

The farmae road with irregular grass verges is just right. It is a country road. Kerbs and paved footwalks would ruin it. If a footwalk is needed for safety reasons, it should be made of gravel, its edges treated as the road edges are now, and separated from the road by a rough grass strip.



2, the Salterns, looking south-east: marsh, shingle, sea—and beach huts, which because of the openness and loneliness have an oddness out of all proportion to their size.



3, the seasonal view from Hill Head Road.

Hill Head Road (b)

This is one of the main entrances to Hill Head and is an object lesson in how a few 'improvements' can spoil a place. The buildings are no worse than anywhere else in the village, but they look less enchanting because they are more exposed. They

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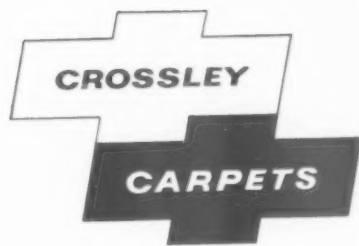
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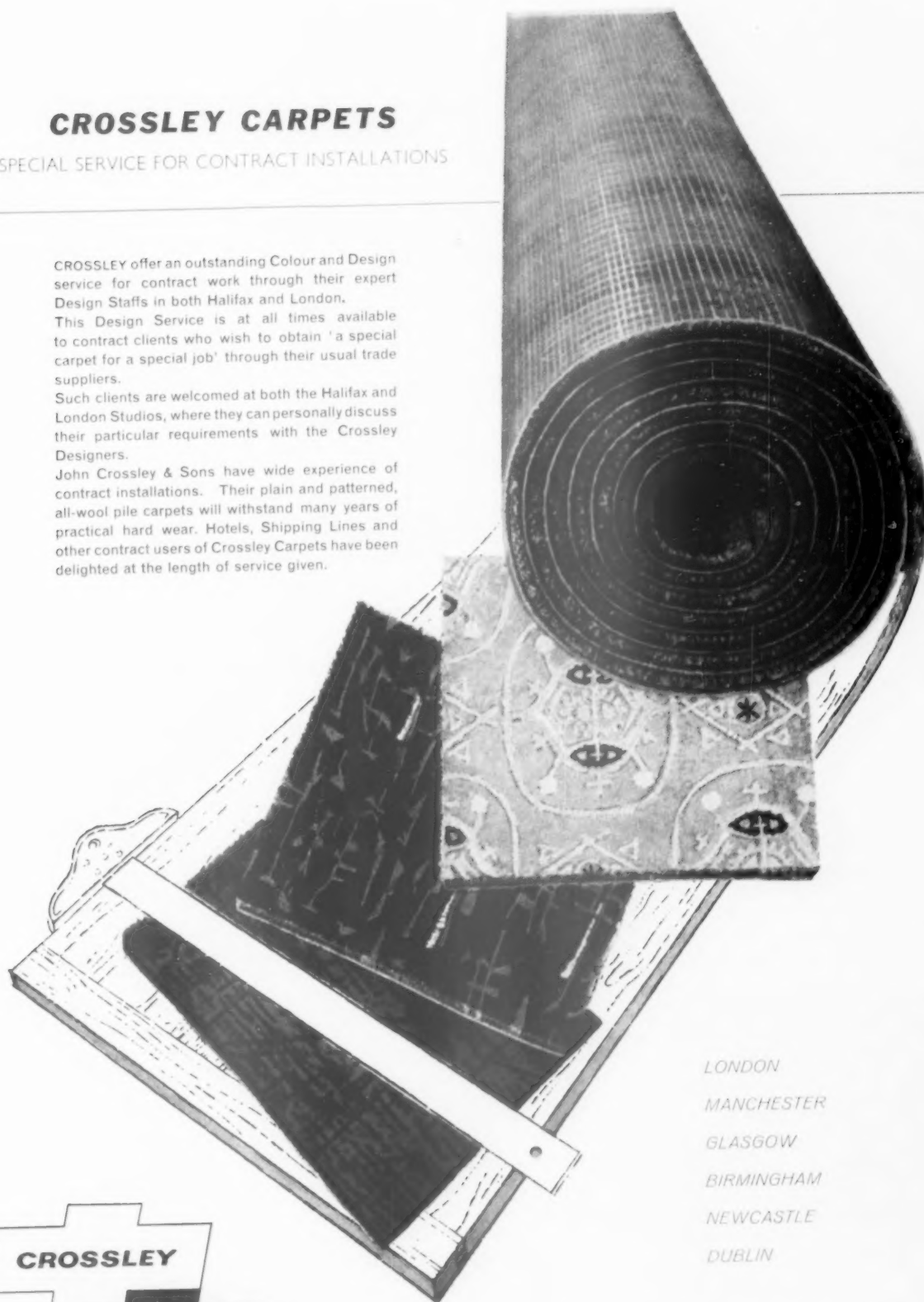
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needn't be obliterated but they could do with being decently dressed.

The road surface is as before, but here it has kerbs white concrete, the cheapest available. The North side of the road is 50 per cent pavement crossing, so that the kerb has become a concrete switchback. This is absurd; if half the length can be 1 in. high, why must the other half be 5 in.? Added to this is a tarmac footwalk, also switch-backed, which adds three unwelcome feet to the paved area which the eye must cross. Even in this narrow place this could have been avoided. It cannot be stated too often that in a rural place, grass and trees are a refuge for the eye; they must dominate and they must be interrupted by artificial paving as little as possible; where there has to be paving it should be divided and conquered. It is also worth emphasising that standard



4, bus shelter on Hill Head Road, with, inevitably, a separate pole for the bus-stop sign.

practice for things like kerbs cannot be applied indiscriminately all over the Urban District; special places deserve special treatment, and sometimes even no treatment at all.



5 and 6, the view from Cliff Row, with the beach huts here accentuating the sweep of the shore, i.e. augmenting the marine effect, not destroying it as in 1.



7, the Haven, a sudden 'topographical joke' after the wide horizons and horizontal lines, a busy small-scale scene of men in boats.

In addition to the corseting of the road, there is a bus shelter of the most insensitive kind, 4, escorted by a separate bus stop and a drunken telegraph pole. Does the bus shelter have to be at the only point on the road where a lay-by cannot be contrived for the bus? The shelter could be more easily fitted in to the landscape at almost any other point on the road. And if it has to be here, does it have to be made of clumsy lumps of asbestos and concrete, too thick to see round but apparently too feeble to take the weight of a bus stop sign?

Cliff Row

Here is the splendour of Hill Head, wind torn, light-drenched, embracing the Solent, 5 and 6. All the houses have big windows upstairs, and so they should. This is the place which attracts, and it seems a pity to squabble over it.

Buildings here can be forgiven architectural eccentricities and forgiven nakedness—what trees could grow in that wind?—because they sink all differences in their common, fixed stare out to sea.

The road is again the right sort of road. There is much argument about parking along here. If parking is to be permitted, and it seems a pity to forbid it, then it would be less nuisance if it was less indiscriminate. Most of the indiscriminate parking arises because the road is too wide. People do not usually park all over the place on a narrow road or where there is an obvious car park. This does not mean a battery of signs and barriers, but parking space defined by a change of surface and confined by high grass verges which cars cannot easily cross.

The Haven

The road ducks down out of the open view, twists down a little canyon, and pops out, facing in a new direction into a new world, full of people messing about in boats, 7. This surprise, a topographical joke, is worth hanging on to. So is the boaty atmosphere.

Buildings at the Haven are interesting, what with the house that everyone thinks is a clubhouse, and the boatshed that is trying to look like a castle. If anyone ever builds anything else here, they should try to continue this oddity.

Peter Beresford

TOWNSCAPE

POTTED JUNGLE

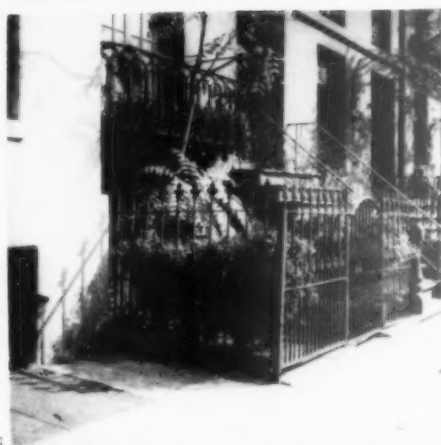
No town dweller can afford to remain out of touch with nature for long; but how is he to be kept in touch? The park and the tree-lined boulevard are two answers, of course; a third, whose great effectiveness and wide applicability are seldom recognized, is the potted jungle. Now there is one very important point about potted jungle: it must be jungle. Elementary? Yes, but often forgotten—and I'm not thinking only of those examples of more or less potted suburbanity (suburbanity=the use



1, English compromise wilderness.



of informal materials to produce would-be formal effects) which have recently disgraced so many of the streets of London. Look at the substructure to the statue in 1. Clearly there was some thought of bringing in the wilderness here. Yet the nett result is as if a stone-breaker had had too much



2, apotheosis of small-scale jungle in Montpellier, and
3, in Agde,
4, in Chicago, and
5, in New York, mingle plants and crabcock ironwork.

time on his hands. Scramble those stones, Sir, get busy with your trowel and whatever growing things you fancy! Then, even if you don't produce so superb an apotheosis of wildness and wet and indifferent statuary as 2, you may at least do as well as the anonymous creator of 3—which is really well enough for almost anywhere (2 and 3 are both French, at Montpellier and Agde). Not that stones and statuary are *sine quibus non* in potted jungle, it should be added. 4 (Chicago) and 5 (New York) have neither. Yet both are irresistible—so much so, indeed, that even the ironwork has apparently joined in the riot! There isn't a town which doesn't contain corners—and even centres, for that matter—where the jungle might not be called in as a foil to buildings and pavements and a refreshment to men's souls. But let it be jungle; if necessary, scramble it!

Andrew Hammer



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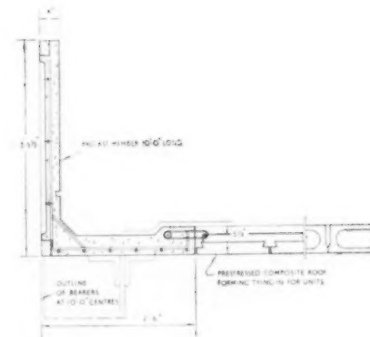
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SKILL

METAL FINISHES PART I

by John Sharp

The architect has never had the opportunity of understanding metals which he has had of understanding wood, or even stone. This deficiency of his has become more critical of late years when the techniques of handling metals have so greatly increased; and particularly is this true of metal finishes—an aspect of metallurgy on which he might well be expected to have something to say. We have, therefore, asked John Sharp to describe and appraise the different metal finishes now in commercial use. This he will do in two parts. In this, his first, he reviews the field, describing each process and the effects it produces. Later he will consider the alternative finishes for each metal and the choice before the architect for a number of recurring problems of design.

Only rarely are metals found in a pure state in nature. They exist in enormous quantities in their various salts, from which they are refined into useable form, either pure or as alloys. Unfortunately most of the common metals under normal atmospheric conditions will not stay pure, but combine with other chemicals to form oxides, sulphates and so forth, a process we normally refer to as corrosion. This corrosion causes a change in the surface appearance of the metal, and in some instances if allowed to continue, will eat into the mass, converting it all back.

Only in a very few instances therefore is it possible to have a pure metal surface exposed, and the methods for protecting the majority of metals vary from transparent skins which allow the metallic surface quality to show, to opaque coatings that impart a surface value of their own.

The principle methods that are used for finishing metals are as follows:

1. Certain metals, either by themselves, or as alloying additions to other metals, form a hard protective oxide layer on the surface, that prevents any further oxidation and needs no other surfacing medium. An example of this is chromium and its use in stainless steel.
2. By the use of a chemical dip which forms compounds of the metal which have a protective or decorative value. The various forms of phosphating on steel are in this category.
3. By the thickening of an existing protective oxide layer by electrochemical processes, such as anodizing on aluminium.
4. By plating the surface with a layer of more resistant metal by means of an electro-chemical process.
5. By the use of a similar coating to 4, but applied by dipping or spraying. Zinc galvanizing is an example of this.
6. By the use of a clear organic coating that protects the surface, but allows the metallic quality to show through.
7. By the use of an opaque coating of paint, enamel or plastic.

PROCESSES

Each metal has its own set of finishes. There are, however, a number of processes which are common to the finishing of several different metals and if we are to avoid repetition, these must be described first.

descaling and pickling

During the production of sheet or

section forms in certain metals, a scale of oxide coatings is formed which must be removed before any finishing process can be applied. The exact form of the scale varies with the mechanical and heating processes involved, and there are a number of processes which are used to deal with each.

blast cleaning

This is especially suited for cleaning cast sections, but may be used for almost any scale where the metal surface is fairly hard. There are two main types of plant—Air Blast, in which the fine grit is projected on to the metal by means of a jet of compressed air; and Centrifugal, where a high speed impeller throws the grit on to the objects. This latter plant is quite widely used in conveyorized processes. There is a third development, the vapour blast plant, which gives a very fine surface effect, and is used to give a satin surface to a base metal before chroming; an abrasive medium is suspended as a sludge in water, and projected on to the article by a jet of steam or air. Originally sand and other fine silica were used as the abrasive media, but the dust from these gives rise to respiratory diseases, and they have largely been superseded by steel or Alumina shot or grit. In some cases choice of shot is limited by the metal being treated; for instance, surface corrosion is liable to occur on stainless steel if it is blasted with ordinary steel.

pickling

This is a chemical process whereby the oxide films, that are formed on the metal surface during the red heat period when it is being worked, are attacked by acids. The scale is removed firstly by the dissolution of some of the oxides, and secondly, by the splitting off of flakes by the gas liberated when the acid attacks the metal surface. The pickling process has been developed to a considerable degree, and numerous refinements ensure a continuity of performance under production conditions. The process is completed by washing to remove any acid.

Another process is Electrolytic pickling, in which the metal is made an anode in a salt bath; hydrogen is produced on the metal, causing the scale to flake; in one process it is immediately replaced by tin out of the salt bath.

polishing

There are, broadly speaking, five polishing methods used: *burnishing*

and *abrasive, barrel, electrolytic and chemical polishing.*

Burnishing is essentially a hand process, in which irregularities are rubbed out by pressure; no metal being removed, but the lumps are pushed into the hollows.

Abrasive polishing is a progressive process, which starts with grinding the rough casting or fabricated object down to a flat surface or given contour removing such imperfections as casting flashes and seam welds. After this initial rough grinding, successive tools are used, starting with wheels of felt or cloth faced with a renewable dressing of abrasive grit, followed by unfaced wheels, the abrasive being fed on to the work from a bar of grease or mixture of grease and abrasive. The cutting quality of the abrasive can be varied by the amount of grease applied. Final polishing is carried out with very fine abrasives such as rouge and a very soft wheel. Special techniques have been evolved for polishing different shapes and materials; clearly it is much more difficult to polish a hard stainless steel than a soft aluminium.

Barrel polishing is a process used for small scale items. They are put into a rotating barrel together with suitable abrasives and scrap metal, the general effect being to rub off all the rough and protruding parts. The process may take up to six hours to complete.

Electrolytic polishing is a wet process in which the metal part is put into an electrolytic bath as an anode. On passing a current through the bath, an insulating film of gas or salts is formed immediately on the surface of the metal. Any high spots on the surface protrude through this layer, and are attacked by the acids in the bath. By continuing the passage of current until the whole surface is reduced to the level of the lowest hollows, a very smooth, bright surface is produced. It is clear that, as the metal is totally immersed, polishing can take place on all surfaces provided that the electrolyte has good throwing power.

Chemical polishing is a very similar process, using a chemical bath that reacts on the metal to produce a gas shield with the same results. Both these processes are used more as a final brightening method than as a complete polishing system. They are particularly suited to hard alloys such as stainless steel and are widely used to finish domestic cooking appliances in aluminium.

degreasing

This is necessary before any of the finishing processes can be applied to a metal surface. There are a number of solvents in general use, and special plant is constructed to deal with specific problems.

ADDITIVE PROCESSES

The processes we have been considering are common to a great number of finishes and in their effect are mechanical (even though the process itself may not be so); though they do something to the surface, they do not add to the composition of the whole. We go on to consider certain standard processes which change the chemical composition of the surface layer.

chemical finishes

Chemical finishes fall chiefly into two classes. There are first the processes known as phosphating as applied to steel and aluminium. These processes, versions of which are practised commercially under the trade names 'Parkerizing', 'Granodizing', 'Bonderizing' and 'Pyluminizing', uses a mixture of the phosphates of iron, zinc and manganese to give both a good mechanical key to paint and some degree of protection against corrosion. Apart from this there are a number of processes which aim at changing the surface colour of a metal.

Metal colouring has much in common with Alchemy; many of the published recipes were arrived at by empirical methods, and some contain more than half-a-dozen constituents. No specific recipes will be quoted here, suffice it so say that there is a means of obtaining almost any metallic colour, if plant and facilities can be found. Most of the colouring mediums are aqueous solutions that can be applied by brushing, spraying or dipping, or can be mixed to a paste or with sawdust to give a semi-dry application. Most of the colouring methods do not give any protective coating to the metal, and so have to be protected by a transparent lacquer or enamel.

anodizing

This process is applied to Aluminium. The metal is dipped as an anode in an acid bath which promotes the formation of additional thickness to the protective oxide layer which forms naturally on the surface. The thickness can be built up as required, depending on the wear to which it will be exposed. B.S.S. 1615 recom-

1,2

1, 2. zinc spray on a small steel plate: 1 reproduced actual size, 2 the same enlarged ten times.

3,4

5,6

7,8

3, 4, 5, 6, 7, 8, a group of three loose butts with different finishes.
3, wrought steel, brilliant galvanized: 4, the same enlarged by ten.

5, wrought steel, bright finish (i.e. polished): 6, the same enlarged by ten.
7, nickel plating on brass: 8, the same enlarged ten times.

mends thicknesses suitable for different uses.

Chromic acid was the first used industrially. It is still used, especially where there is the possibility of electrolyte being trapped in assembled parts as it is non-corrosive. The film produced is greyish in appearance and there is differential colouring on different parts, giving a mottled effect.

The sulphuric acid bath produces a harder film that is transparent, and can be successfully dyed by dipping in a dye bath. On pure Aluminium the film is transparent, and clear colours result, but on silicon Alloys a grey film is produced, that results in grey modified colours. Anodic films may also be treated with a photo-sensitive gelatine emulsion, that may then be treated by the normal photographic process. This process is widely used for producing Anodized instrument panels, indicators and instruction plates.

The metal surface may be treated by any of the normal mechanical or chemical surfacing treatments, and is then degreased before being anodized. After Anodizing and dyeing the metal is rinsed in cold water, and then sealed by boiling in water for about half-an-hour. This has the effect of converting some of the oxide film to a hydrated form, which fills the pores in the film.

plating

Plating is an additive process and it is common practice to plate the original metal with several different plating layers in order to produce the desired result. Thus nickel plating is more effective on steel if a copper or brass plating layer separates the two; and chromium plating is more effective if it is laid on a nickel plating layer.

The principle of plating is as follows. The metal object to be plated is made the cathode in an electrolytic solution; the anode is made of the metal to be deposited, and if the system is accurately balanced, the solution remains of a constant composition, while the anodic metal is deposited on the cathode. There are numerous refinements in the form of additional salts in the bath, which ensure that the solution has a good throwing power—that is, that the deposition takes place as uniformly as possible on all sides and surfaces of the cathode. It is clear that this process takes place in a tank, and the size of objects to be plated must be designed down to the available tank size.

Nickel plating: nickel plate has a dull whitish appearance. It can be built up to a thickness of several thousands, the B.S.S. 1224 recommends minimum deposits for different conditions of use on Steel and Brass bases, both for Nickel used by itself and also with Chromium as a surfacing coat. Dull Nickel Plating may be polished, but this reduces the thickness.

By the use of chemical additions to the bath, bright Nickel Plate can be produced. This requires no polishing and the deposits are generally harder and of a finer grain than the dull deposits.

Chromium plating: bright chromium deposits are primarily used as surface finish, as Chromium produces a very thin protective oxidized layer that with occasional cleaning can be preserved indefinitely.

Chromium deposits are highly stressed, and if too great a thickness is built up, the surface cracks. Further deposition adds to the thickness,

[continued on page 345]



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(Eastern Region) British Railways.

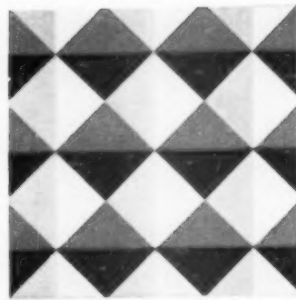
Monsanto Chemicals Limited, Oil additives engine
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Bernard A. Miller, B. Arch., F.R.I.B.A.

Office Building. Architect: Richard Sheppard &
Partners.

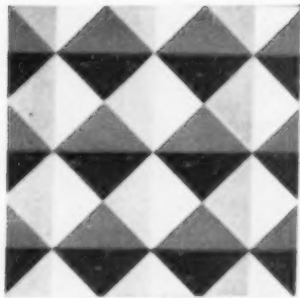
Broadgate House, Coventry, Warwickshire.

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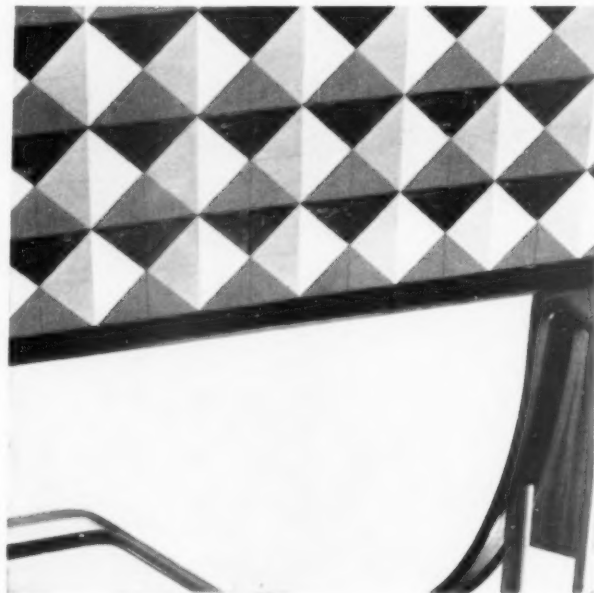


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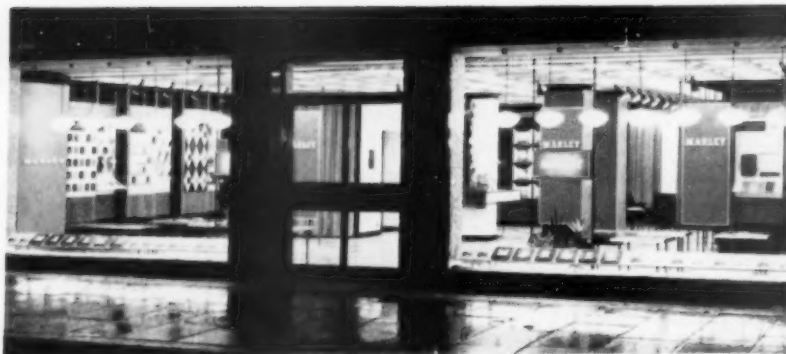
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continued from page 344]

covering the cracks, but again cracks at a later stage. The result of this is clearly an uneven coating, and for decorative purposes only a very thin coating is used. This has little anti-corrosion value, but protects the Plating layer underneath, normally Nickel. Thick deposits are used for engineering purposes, which are then machined to give good bearing surfaces.

Copper is widely used on steel to form a base for Nickel Plating; it improves the surface of the Nickel deposit, and also improves the corrosion resistance. It is also widely used as a base for Nickel plating on zinc alloy die-castings, where it prevents the Nickel solution attacking the zinc. A thin copper plate is used on steel for some of the coloured finishes.

Cadmium plating gives good protection on steel, and is widely used on fittings exposed to corrosive atmospheres, such as aircraft and marine components. Its appearance is more pleasant and whiter than zinc deposits, but the basic material cost is considerably higher.

Zinc plating has a high protective value, though it does itself corrode at an appreciable rate. It is used for small items of ironmongery where a better appearance than that obtained by hot dipping is required. A modified process called brilliant galvanizing gives a bright finish with a bluish tinge. It is being used as a finish for small items of ironmongery such as hinges. There are also several processes for electro-galvanizing sheet steel; the result is a thinner coating than with dipping, which is able to withstand greater deformation without flaking.

hot dipping

This is a coating process, in which a suitably pickled and prepared sheet or object is dipped in a bath of the molten covering. Only metals with a low melting point can be used, otherwise there is too great an annealing (i.e. softening) of the base metal, and also a layer of alloy is formed between the two metals which increases the tendency to flake under deformation. Hot dipping is a cheaper and generally speaking, an inferior process to plating, not only because it is less durable, but because the coating is much less regular and, being thicker, gives rounded profiles to all angles.

spraying

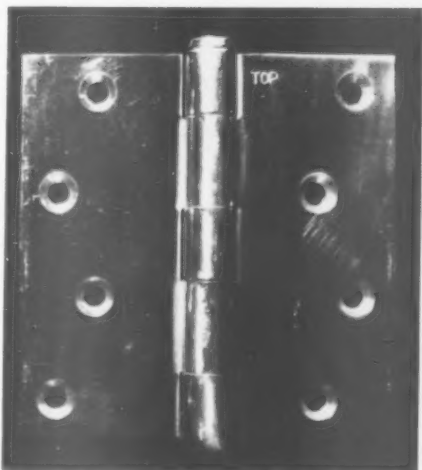
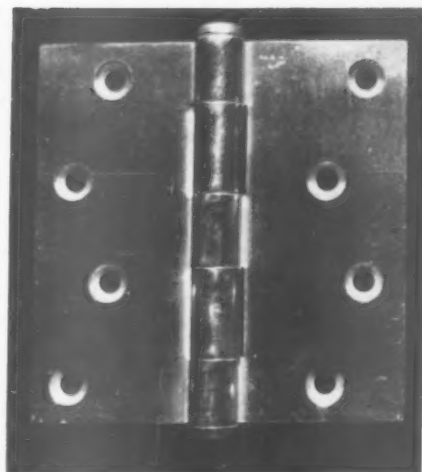
Almost any metal may be sprayed if the melting point is not too high. It is a process that can be used anywhere as the plant can be mobile, and the application tool is in the form of a gun. The resultant coating is porous and forms a good basis for paints. Generally, the metal surface is prepared by blasting to give a clean, rough surface. There are two processes, one using a powder of the metal that is blown by gas to the nozzle of an oxygen-gas flame, where it is atomized and deposited on the metal surface. The other process involves the use of a mechanically fed wire instead of the powder.

NOMENCLATURE OF METAL SURFACE FINISHES

B.S.S. 1448 gives definitions for four different types of metal surface finish.

Polished Surface (P). The metal as it is left in the final polishing operation.

Satin Surface (S). This surface is similar to polished surface which has



9, polished chromium plated brass; 10, the same enlarged ten times. 11, 12, polished steel, bronze plated. There is a considerable colour difference

between these two finishes, that shown in 11 and 12 having the familiar pink tinge of copper, and that in 9 and 10 being yellow, with the green tinge of brass.

been scoured with pumice. The lines shall be parallel throughout the whole article unless otherwise specified. This surface is intended to reproduce that of satin which shows a different effect according to which way the light strikes it.

Eggshell Surface (E). This surface is similar to a surface produced by slight matting, such as would be obtained by a mild etch. The roughening has no orientation and looks the same whichever way the light falls.

Frosted Surface (F). This is similar to eggshell surface, but the matted effect is deeper. It is obtained by sand blast, chemical etch or by depositing a thin layer of copper from an acid copper solution.

ORGANIC COATINGS

Organic coatings fall generally into two classes; those which are air dried and which include most paints, varnishes and lacquers and those which are stoved, of which the most characteristic are the stoving enamels. Of the first group we propose to say little since, as they are essentially site techniques, they are already familiar to the architect.

air drying coatings

The disadvantage of air drying coatings is that when they are drying they collect dust from the atmosphere, and for this reason it may be said that other factors being equal, the shorter the drying period, the better the finish. Thus spraying with a quick drying coating will give a

better finish than brushing with a slow drying one. It is, of course, a wish for better control which has led architects to prefer stove enamelling, where cost allows it. But, as against this, it must be pointed out that stove enamelling if chipped, is impossible to patch (or match) and that the visual difference between paint and stoving is not always easy to detect.

stoving enamels

Stoving enamels are plastic resins, suspended in a suitable medium, which are sprayed on to a prepared metal surface. After the medium has evaporated, the metal is heated to a sufficient temperature to cause the resins, which are generally complicated combinations including urea formaldehyde or melamine formaldehyde, to polymerize; that is, so to alter their internal molecular structure that they become hard and maintain the assumed sheet form. Generally it can be said that a well applied resin with a good primer is superior in resistance to abrasion than an air drying paint, but its main advantage is that the application and processing can be closely controlled and a near perfect finish obtained.

There are a number of different finishes obtainable with stoving enamels and these are described below.

High gloss stoving enamels can only be applied to fully prepared surfaces, otherwise blemishes on the surface show through the enamel.

A well applied and fired enamel that is given the correct pretreatment processes should have a better performance than non-stoved films.

Instrument Finish: This is a similar enamel to the high gloss, but has an additive that causes a slight breakdown of the surface to give a uniform Eggshell surface. This finish is particularly suited for the coating of scientific instruments, where a non-reflective surface is important; it has not got the same resistance to wear as the equivalent high gloss type.

Wrinkle Finish: This is a two-coat application, where the second wrinkles up on firing to give a uniform, slightly textured surface, 13. The metal does not need to be so well prepared as for the smooth enamels. Though the rough surface is pleasing to the eye when new, the tops of the ridges are worn off by handling, and grease accumulates in the hollows. The grease is difficult to remove and worn areas difficult to replace.

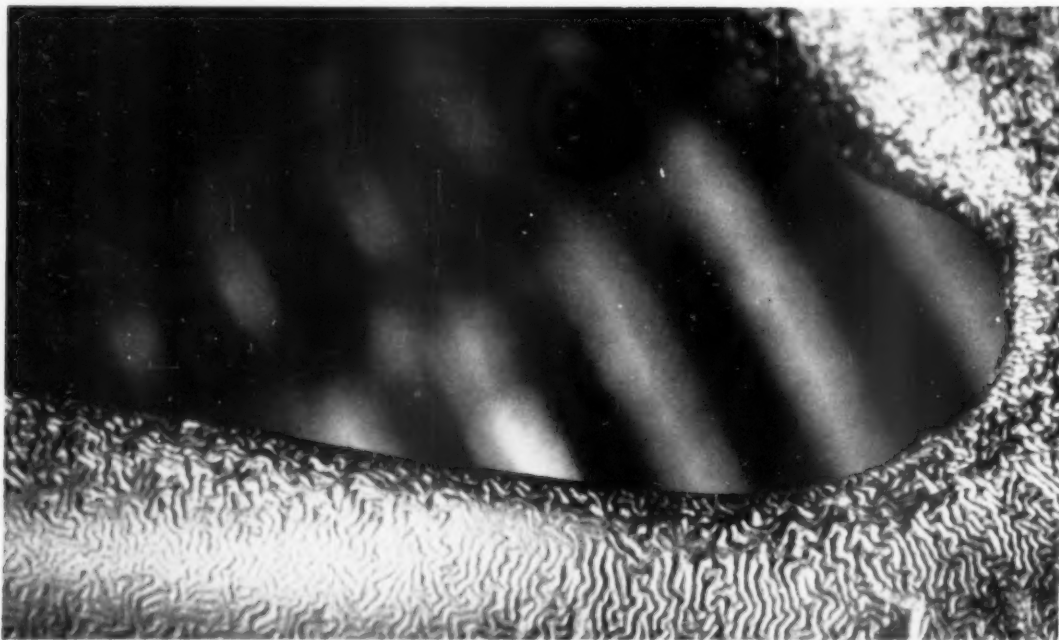
Cracking Finish: This is a rather unpleasant effect that is obtained with a two-colour, two-coat application, where the top coating cracks open on stoving, to display the colour of the undercoat.

Hammer Finish: This is a one-coat finish that is being used increasingly. It has a hard, glossy surface that has pittings on it, 14, 15. These are caused by a medium which upsets the smooth surface during stoving; the size and frequency of pittings can be varied. Industrially this finish has two advantages; it can be applied to

9, 10

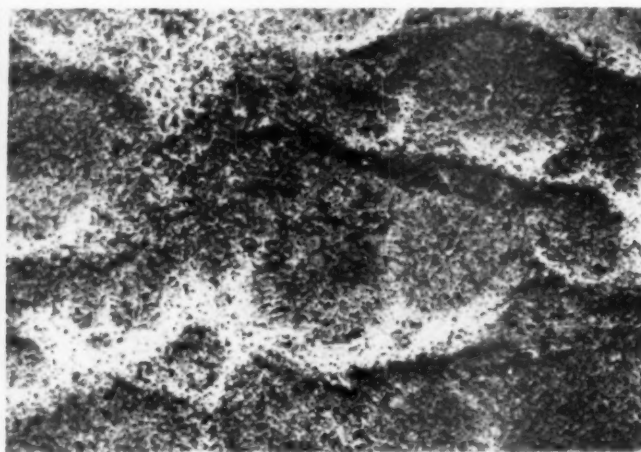
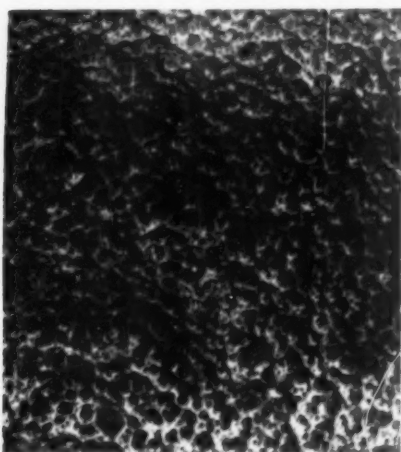
11, 12

SKILL



13

Enlargement by ten of typewriter shield showing wrinkle finish enamel.



14, 15

14, 15. actual size and enlargement by ten of steel plate with hammer finish.



16

Strippable plastic coating partly torn off the steel plate it has been used to protect.

it will be used increasingly for washing machines and similar articles. As the firing temperature is not as high as for vitreous enamel, the rejection rate due to distortion is far lower.

plastic coatings

Plastic coatings are of two kinds. There are first a group of strippable coatings which are used to give temporary protection to fine metal finishes and which are then removed when these are finally in place and there are the many different kinds of permanent coating which are intended to last as long as the component they cover.

Strippable coatings are used to protect highly finished metal articles from accidental damage. This is normally done by a series of wrappings, but for smooth finishes such as Chromium Plating and Anodized surfaces, there are now spray applied strippable coatings. They are tough plastic films which adhere to the metal surface tenaciously when unbroken and are able to withstand the minor abrasions to be expected during handling and transit and yet are instantly strippable from a broken edge when required. 16.

Permanent plastic coatings: there are a number of different coating methods that are in current use. They all give protection to the metal, provided that the surface is suitably cleaned and that the coating remains undamaged.

The methods employed are described briefly below; more details will be given in the steel section of the second article.

Polythene and Nylon can both be sprayed: they are heated to a molten state and sprayed on to the surface, where they solidify as a uniform film.

Polythene and Polyvinyl chloride can be applied to small fabricated articles by a dipping process, the advantage being that complicated articles such as wire plate racks can be completely coated with a resilient protective film. The P.V.C. is in hot liquid form while the polythene is as a hot agitated powder that is fused on to the metal.

Another method of using P.V.C. is applied to tubes and rods: an expanded tube of P.V.C. is slipped over the metal and heated, which causes it to shrink to the metal size.

Finally there is a recently developed process whereby the metallic coating of steel strip in the mill by zinc and tin is replaced by a plastic film permanently bonded to the steel. This is capable of being subjected to normal sheet fabrication processes and may well bring about radical changes in the use of metal.

vitreous enamel

This is an inorganic coating in which pigmented glass is fused on to the metal. The constituents of the enamel are mixed together and fused in a furnace to form a glass-like material which is then quenched, ground into a fine powder in a ball mill and mixed to a paste. The steel surface is prepared by a Nickel deposit which aids good adhesion. The paste is then applied and fired at a temperature of about 800°C. Two coats have normally been necessary as gas bubbles and pitting occur in the first coat. However, there are now processes which prevent this, and one-coat applications are now possible. Enamel has a very hard surface, but is brittle and is only suitable for objects that are not liable to appreciable deformation such as cast-iron baths.

metals that have not had the careful preparation necessary for high gloss coatings, and it requires only one coating. Unfortunately, however, these enamels contain aluminium, which makes it impossible to obtain pure colours, and also the pittings effectively reduce the thickness of the coating, and reduce its protective value.

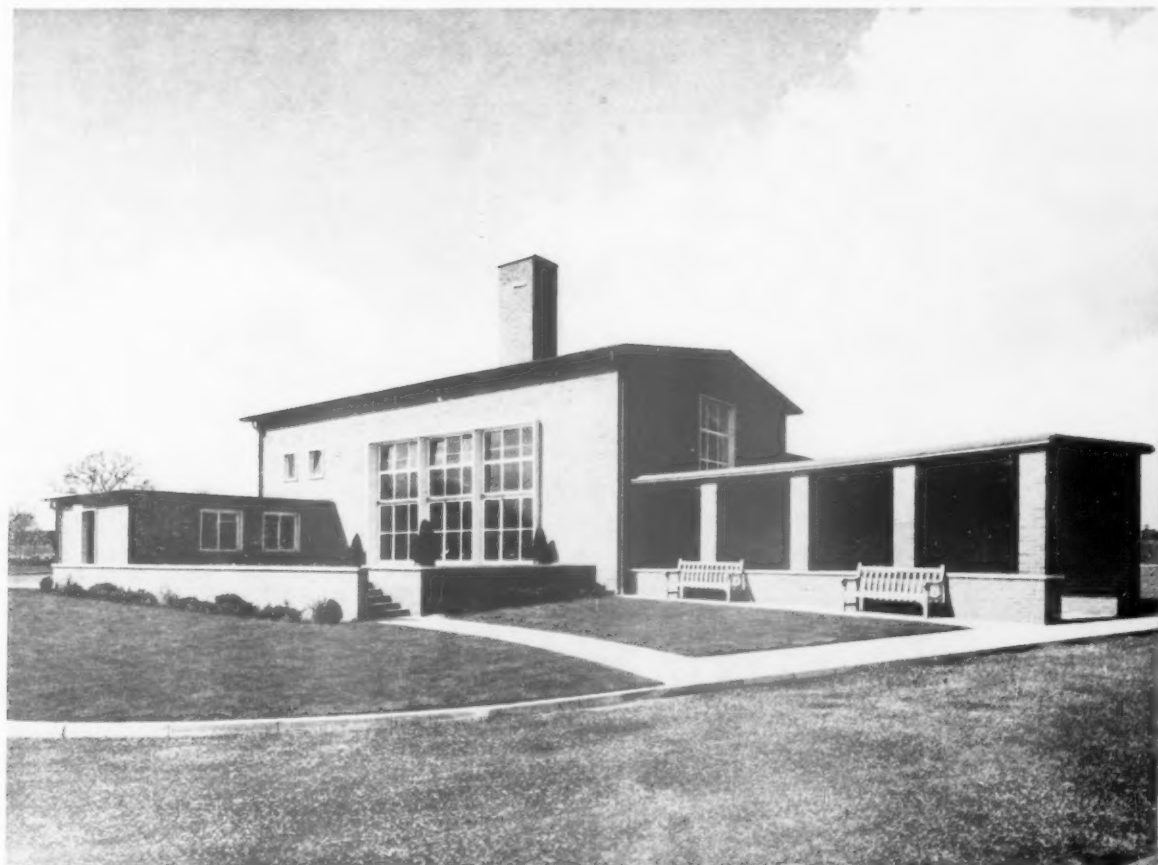
There are two resins that have recently been introduced as stoving finishes, which give superior performances over other enamels:

Epoxy Enamels. These are based on epoxy resins and are superior in all respects to normal stoving enamels. They have high adhesion, are very durable and are resistant to chemical, particularly alkaline, attack.

Acrylic Enamels. This is the most interesting development in the enamels category and has advantages over other stoving finishes. It is extremely hard, its resistance to abrasion approaching that of vitreous enamels; the colour range is good and the surface of a very high standard; indeed, it is touch dry within a few minutes of spraying. Its other important property is resistance to alkaline attack from such things as domestic detergents, and it is to be hoped that

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THE INDUSTRY

Electric Heating

Portable electric convectors and radiators have developed a long way in the last few years. Their design appears to have been taken out of the hands of workshop managers and salesmen and passed on to those with a more sophisticated industrial design background. Such is the new heater by Hursel (of Hurdapla fame). It is about 2 ft. high and 2½ in. thick finished with cream sides and gold anodized edges and grille



1, the 'Hursel' radiator.

top. Loading is 2 kW so that, full on, the output would be something over 6,500 BTU per hour. There is a three-heat switch and the heater can be supplied for either 230/250 or 200/210 v. ac. The carrying handle is arranged to 'swing the appliance well clear of the body.' Price, including P.T., £8 19s. 6d.

Hursel Ltd., 229 Regent Street, W.1.

Unit Air Conditioners

Unit air conditioners are appropriate to meet two kinds of situation. First, where the installation of a ducted system in an existing building would be difficult and costly. Second, where some offices in a building require air conditioning and others do not, for example, in suites of offices let to different organizations. Two models answering these needs have recently been marketed which are simple to install and economical to operate. The model illustrated, 2, has a loading of 1 kilowatt, and if fitted with a heat pump, an optional extra, will provide 2.8 kW. output. It is thermostatically controlled, will provide a circulation of warm or cool air, filtered through a glass fibre filter. The probable life of the filter is claimed to be about three months. Each unit is designed to allow for individual control of temperature and humidity, and the rate of air exchange is quoted as 500 cu. ft. per

minute. Fitting is recommended at approximately three feet above floor level, and the unit may be fitted into a window or outside wall. The cost per unit is £184 10s. 0d. when fitted with a heat pump, and £172 10s. 0d. without. They are manufactured by Westool Ltd., St. Helen's, Auckland, Co. Durham.

Roof Sheetting

Messrs. Robertson Thain have issued the third in their series of 'Codes of Practice.' An accompanying note points to the variety of opinion on acceptable deflections for corru-

gated sheet steel roofing and suggests the need for comprehensive tests to remedy this situation.

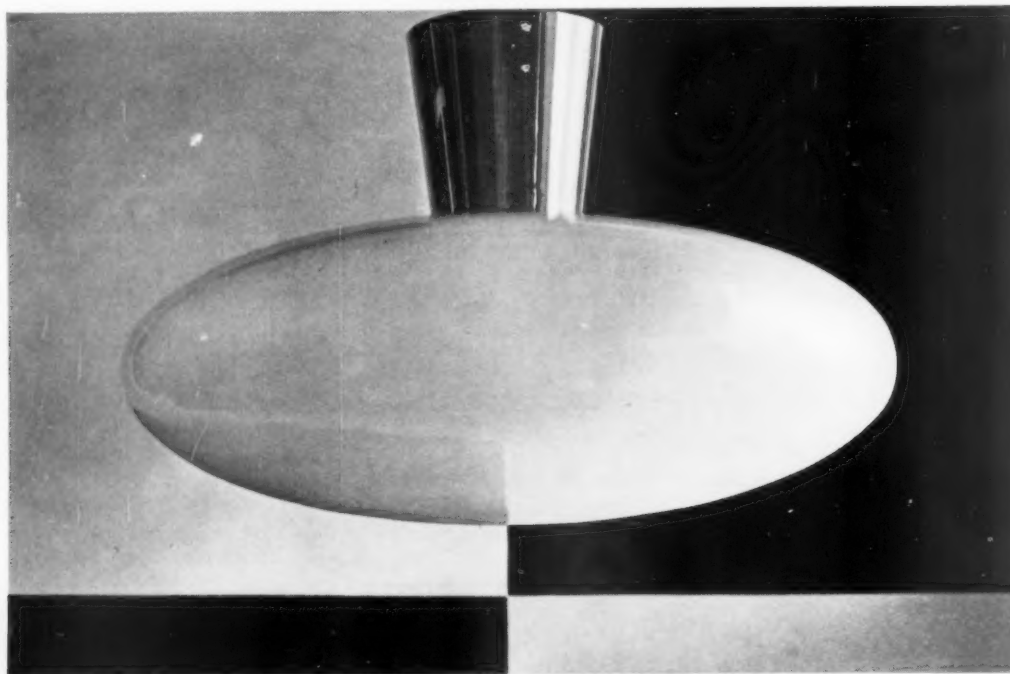
These, the brochure presents in the form of six tables which tabulate the deflections of different types of sheet over different spans and for different pitches. The constant in these tests was the superload of 15 lb. per sq. ft. (measured on plan) and each table has zig-zag lines marking off the deflections exceeding 1/150th and 1/200th of the span, the former figure being accepted by some authorities as a limit. The types of sheet tested were the 2½ in. and

[continued on page 350]



2, 'one-point-free' model Westair Climaticizer.

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3, heating cables being installed in ceiling plaster.

continued from page 348]

3 in. corrugation, the V beam, Box rib and FVB sections varying from 24 to 16 gauge in thickness.

This is a useful table to have in the files but one could have wished for a really comprehensive coverage of sheets on the market and better presentation.

Robertson Thain Ltd., Ellesmere Port, Wirral, Cheshire.

Electric Floor Warming

The very low installation cost of electric floor warming mitigates the otherwise discouraging running costs of electricity. Indeed it has been calculated that some 18 years must elapse before combined capital and running costs of this method draw level with the corresponding figure for more familiar systems. Cleanliness and ease of control offer further

inducements. It is therefore interesting to report the use by an enterprising Cheshire builder of heating cables embedded in the ceiling plaster. They are tacked on to a scratch coat, 3, with a stapling machine and then covered over with finishing and skim coats.

Makers of the cable: Aerialite Ltd., Castle Works, Stalybridge, Cheshire.

Uses for Polythene Film

ICT's 'Visqueen' polythene film is well known to most people, but the building industry has been slow in adopting polythene film techniques which could be greatly to its benefit. Polythene film is generally readily welded by a low temperature technique, and is impervious. It would be most appropriate, economically and technically, as a substitute for asphalt in certain situations. The



4, the 'Visqueen' polythene waterproof membrane being used in the construction of a swimming pool.

illustration, 4, shows a pool under construction using 'Visqueen' polythene film. The film can be used as a tanking membrane in a normal sandwich construction appropriate for the particular conditions of loading and water pressures, but care must be exercised in handling the material, since while it is tough it is not untearable. The particular pool illustrated, which used 'Visqueen' polythene film, cost £308 complete (but built with voluntary labour) and the film in this instance was used as a waterproof lining beneath the concrete, i.e. as a bag containing the finished pool.

Swimming pools are not the only use for a waterproof film of polythene. Builders have used it for some time as temporary glazing. It has also been used as a waterproof membrane in solid ground floors, damp proof courses, and for lining

damp buildings generally where other techniques are not appropriate.

British Visqueen Ltd., Stevenage, Herts.

Basin for Spray Taps

A new pamphlet has recently been released by the manufacturers of Unatap illustrating some of the basins which have been specially designed for the Unatap. This is the spray mixing tap first designed by BRS which uses less water than the conventional 'h. and c.' The intention is that washing shall be performed under running water and therefore the basins may dispense with the normal plug and chain fittings, and be rigidly symmetrical in design. Two of these basins are here shown, 5, with the 'Unatap' fitted. One (below) by Adamsez Ltd., 75 Victoria Street, S.W.1, the other (above) by The Leeds Fireclay Co.

[continued on page 352]

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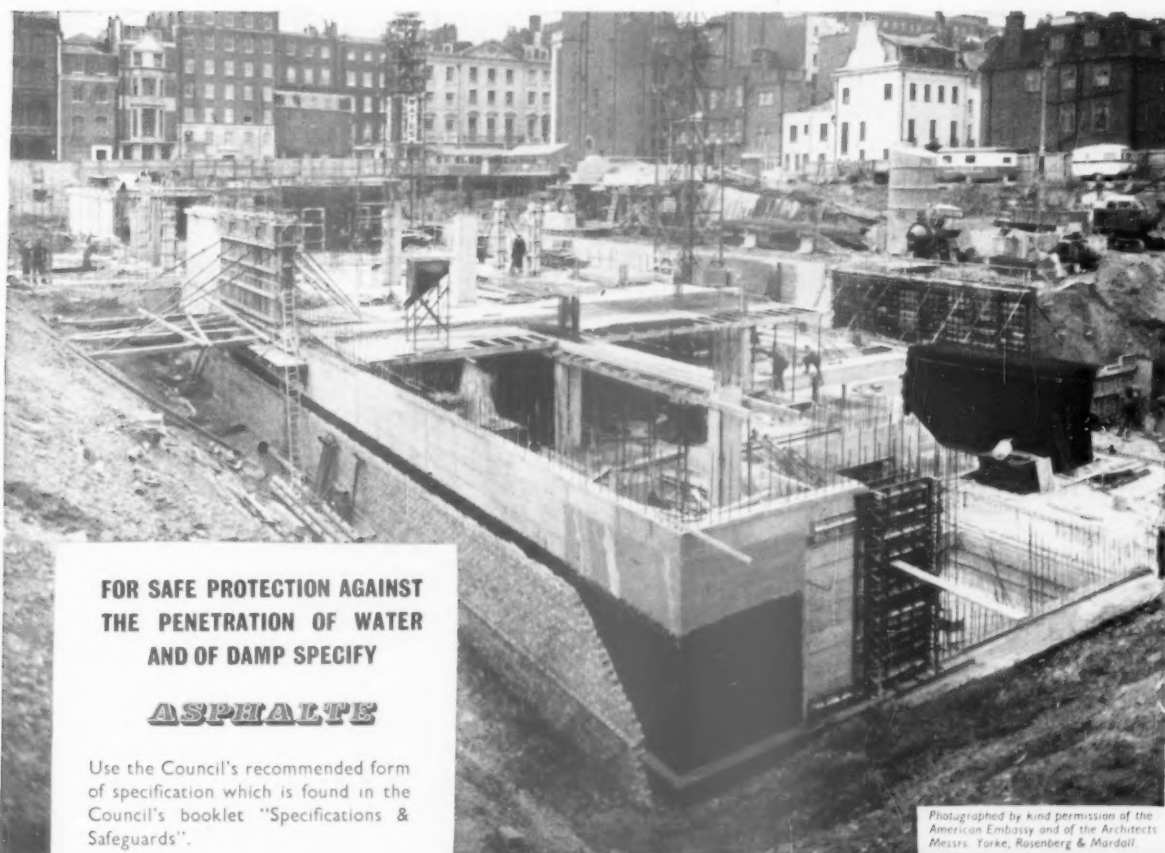
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5, two basins with the spray mixing tap.

Ltd., Leeds House, Cavendish Place, London, W.1. It will be noticed that neither basin has the normal overflow, hence shapes are simple and relatively unencumbered. The 'Unatap' itself is made by Walker Crosswell & Co. Ltd., Cheltenham, Glos.

CONTRACTORS etc

Offices at 61, Portland Street, W.1. Architects: Chamberlin, Powell & Bon. General contractor: Heeps Willard & Co. Sub-contractors and

suppliers: Electrical sub-contractors: John Hearson & Co. Mural in entrance lobby: R. Brandt. Curtains: Primavera (London) Ltd. Carpets: A. V. Humphries Ltd. Blinds: J. Avery & Co. Furniture: Conran Furniture. Marble: Fenning & Co. Aluminium table frame: Syntilla Manufacturing Co. Brass trimming: London Metal Warehouses Ltd. Special door handles: Yannedis & Co. Mosaic tiles: Denis Williams Ltd. Door mats: R. R. Bardrick & Co. Nameplates: The London Name Plate Manufacturing Co. Mural panels and door push plates: Philip Pound Ltd. Light fittings: Courtney Pope (Electrical) Ltd.; George Forrest & Son. Under carpet heaters: Thermalay Ltd.

Offices at Chancery Lane, W.C.2. Architects: J. M. Austin-Smith & Partners. Main contractor for interior: Artisans (London) Ltd. Sub-contractors and suppliers: Flooring: Marbolith Flooring Co. Electrical installation: Troughton & Young (Electrical) Ltd. Light fittings: Forrest Modern; Merchant Adventurers Ltd.; Atlas Lighting Ltd. Clocks: Baume & Co. Glass screens: James Clark-Eaton Ltd. Ironmongery: H. & C. Davis & Co.

Offices at Bedford Square, W.C.1. Architects: Trevor Dannat. General contractors: F. W. Clifford. Nylux tile flooring: Semtex Ltd. Lino flooring: Resilient Tile Flooring Co. Upholstery fabric: Primavera. Light fittings: Troughton & Young; Herbert Terry. Evertaut typists' chairs: Hill & Noyes Ltd. Furniture for rear office: Liberty Contracts Ltd. Canvas: C. W. Robertson. Ironmongery: A. J. Binns Ltd.

Housing at Putney. Architects: Sir Lancelot Keay, Basil Duckett & Partners. General contractors: Stage 1:

George Wimpey & Co. Stage 2: J. Jarvis & Sons. Sub-contractors: Plumbing: Stage 1: Ellis (Kensington) Ltd. Stage 2: Arthur Seull & Son. Lifts: Bennie Lifts Ltd. Structural work: Stage 1: High blocks: George Wimpey & Co. Low blocks: Caxton Floors Ltd. Stage 2: High blocks: J. Jarvis & Sons. Low blocks: Expanded Metal Co. Windows, door-frames and screens: Hollis Ltd. Metal staircase windows: Henry Hope & Sons. Bricks: Broad & Co. Sanitary fittings: Stage 1: John Bolding & Sons. Stage 2: Lewis & Co. (Batham). Kitchen fittings: E. & H. Grace Ltd. Balcony facings: Empire Stone Co. Built-up roofing felt: William Briggs & Sons. Roof tiling: E. F. Williams Ltd. Precast concrete cladding: Mono Concrete Ltd. Wall tiling: Stage 1: Camden Tile & Mosaic Co. Stage 2: S. A. Forbes & Son. Door furniture: Stedall & Co. Metal hoppers: Broad & Co. Laundries: Electrolux Ltd. Railings and general metalwork: Light Steelwork (1925) Ltd. Double glazing and Muroglass: Hollow Seal Glass Co. Lightning conductors: F. E. Beaumont Ltd. Nameplates: Butler Jones Ltd. Thermoplastic flooring: Stage 1: Armstrong Cork Co. Stage 2: Marley Tile Co. Landscaping: Knowles & Weller Ltd.

House at Stratford-on-Avon. Architect: Denys Hinton. General contractor: Colman & Tyas Ltd. Sub-contractors: Timber frames: Highworth Processes Ltd. Glazing: Glass (Coventry) Ltd. Plastering: Thorneywork & Sons. Roofing: R. J. & T. Wormell Ltd. Ruberoid Co. Landscaping: Hewitt & Co. Suppliers: Double glazing: Plyglass Ltd. Paint: Permoglaze Ltd. Ceiling tracks: Harrison (Bham) Ltd. Wall and floor coverings: Arlington Plastics. Tiles

(wall): Coloucraft. Tiles (floor): Langley London Ltd. Kitchen equipment: Dishmaster Ltd. Fridge heater: Ferranti Ltd. Taps: Sanbra Ltd. Lighting: Geo. Forrest & Son. Carpets: S. J. Stockwell (Carpets) Ltd. Furniture: Times Furnishing Co.

Offices at the Barbican. Architect: Frank Searlett. Main contractors: Wyatt (Builders) Ltd. Steekcork: Aston Construction Co. Concrete floors and basement retaining walls: Concrete Ltd. Asphalt: Highways Construction Ltd. Piling: Piling Construction Co. Preliminary site works: Griggs & Son. Drainage: D. R. Patterson Ltd. Staircases: Peerless Plant Hire. Metal windows: Williams & Williams Ltd. Portland stone: Walton Goody (Construction) Ltd. Heating, hot water and electrical: Matthew Hall & Co. Marble: Fenning & Co. Terrazzo panels (external): Cooper Wettern & Co. Lifts: Hammond & Champness. General ironwork: Haskins Ltd. Fibrous plaster ceilings: G. Jackson & Sons. Kitchen ventilation: Vent-Axia Ltd. Metalwork: Willard Engineering Co. Lettering and carving: E. J. & T. A. Bradford Ltd. Internal cement glaze: Robbs Cement Enamel Finishes Ltd. Internal partitions: Gyproe Products Ltd. Pavement lights: J. A. King & Co. Cross-over: W. F. Rees Ltd. Asphalt: Val de Travers Asphalt Ltd. Flagpole: Benjamin Edgington Ltd. Lightning conductor: R. C. Cutting & Co. Acetate flooring: Armstrong Cork Co. Railings: S. W. Farmer & Sons. Roof lights: T. W. Ide Ltd. Slate eills: Bow Slate & Enamel Co. Sanitary fittings: Shanks Ltd. Floors above ground-floor level: Cax on Floors Ltd. Artificial stone: Entfield Stone Co. Joinery: C. Jay & F. A. Cole Ltd. Ironmongery: F. Knight & Co.

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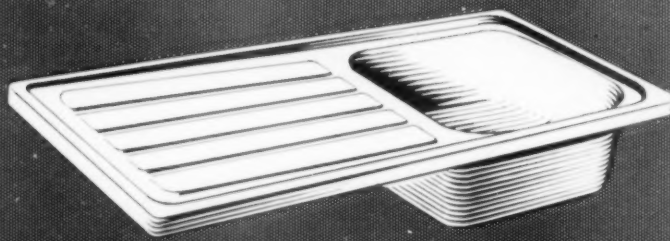
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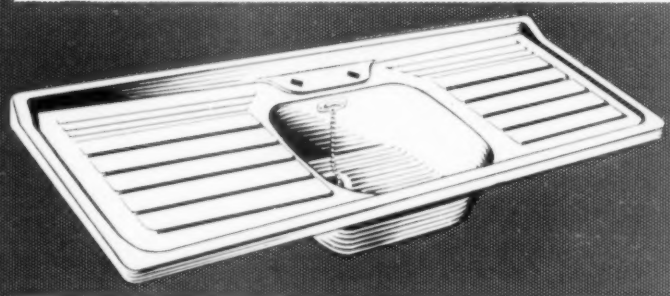


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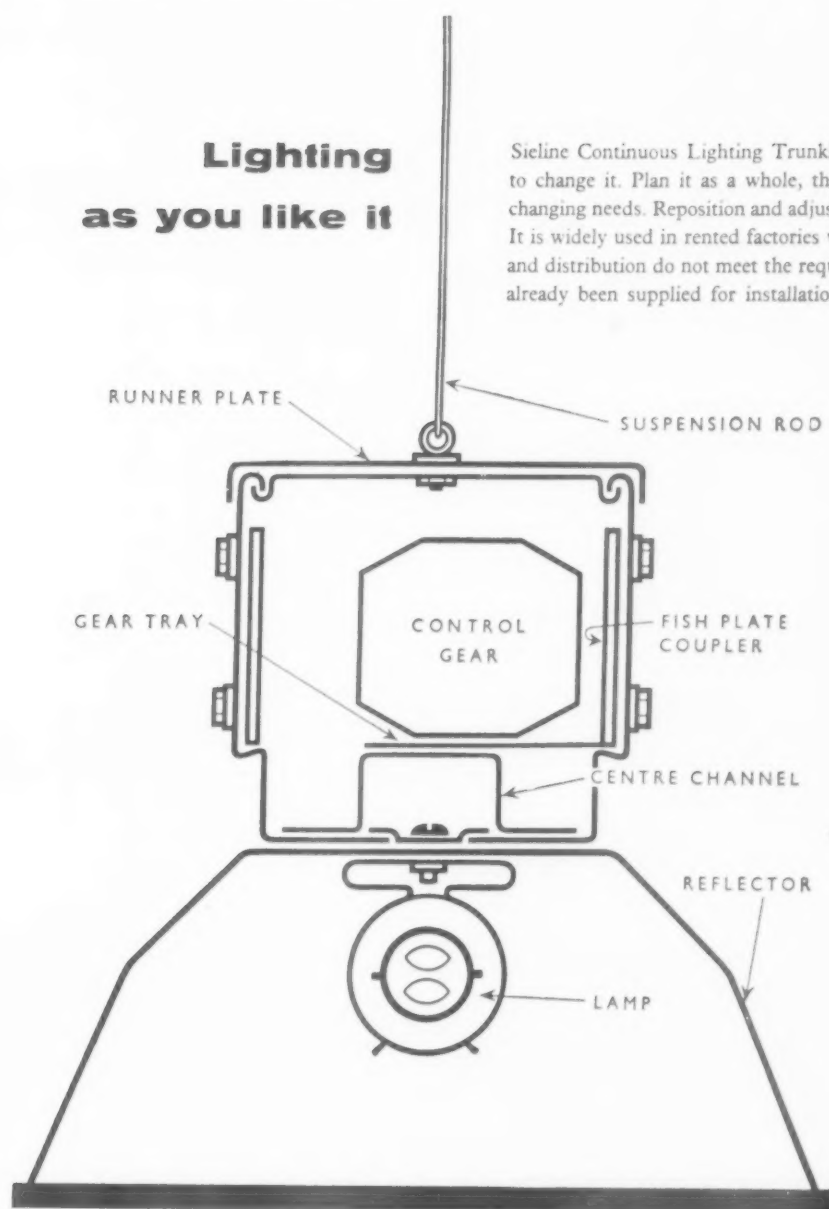


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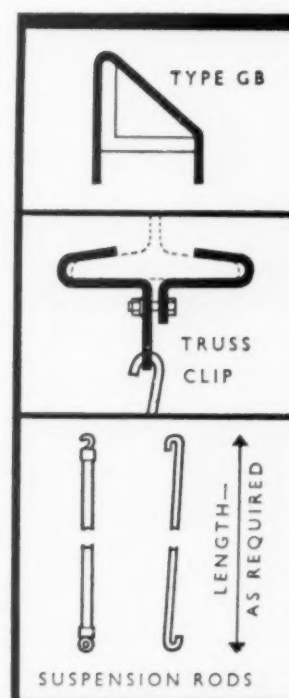


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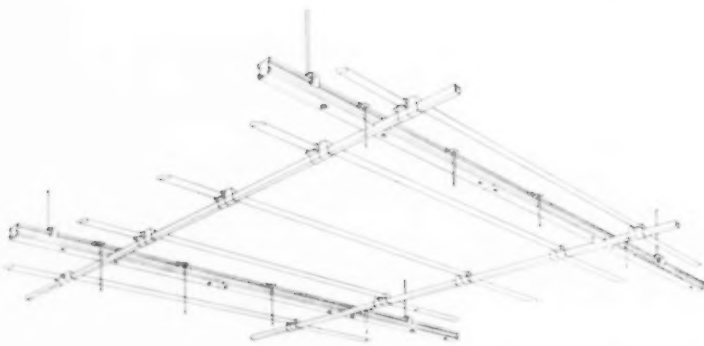
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atlas sylvalume

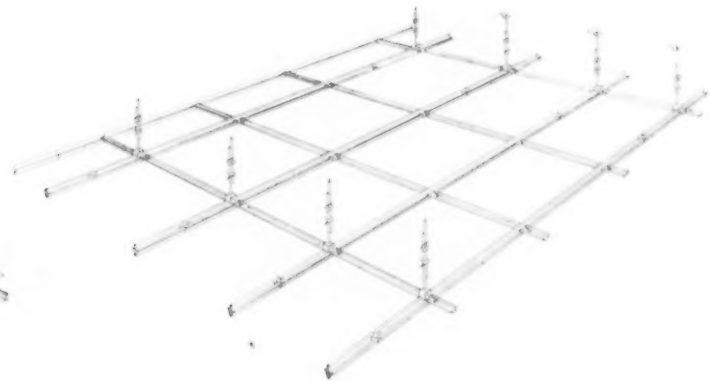
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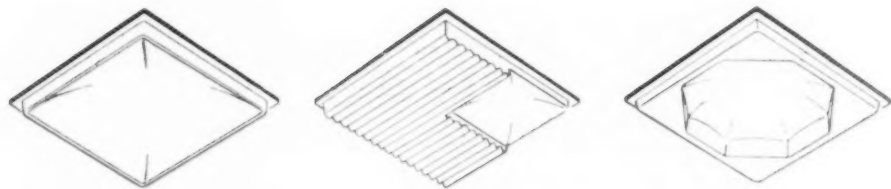
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Appearance of Sylvalume grid from above.





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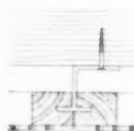
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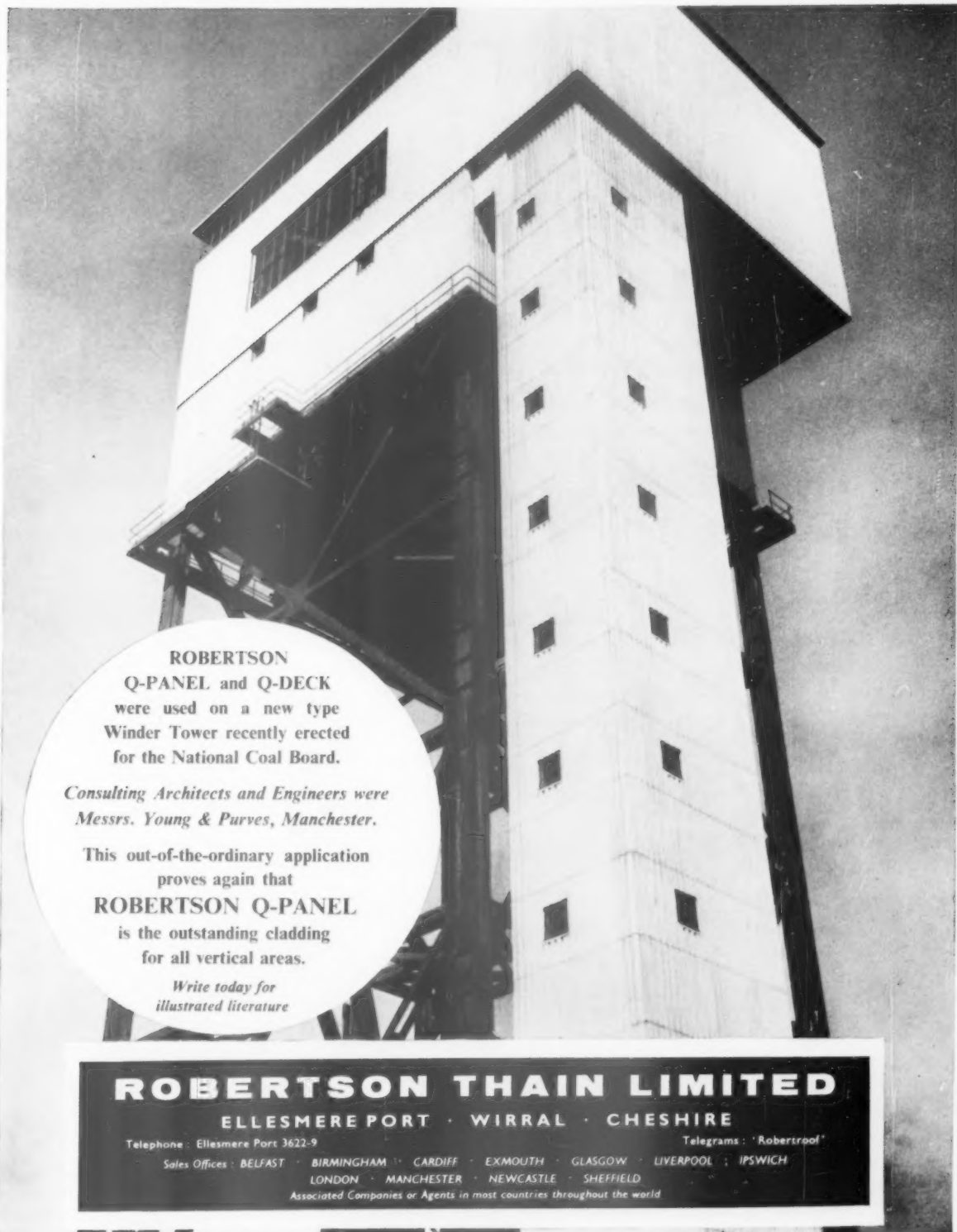
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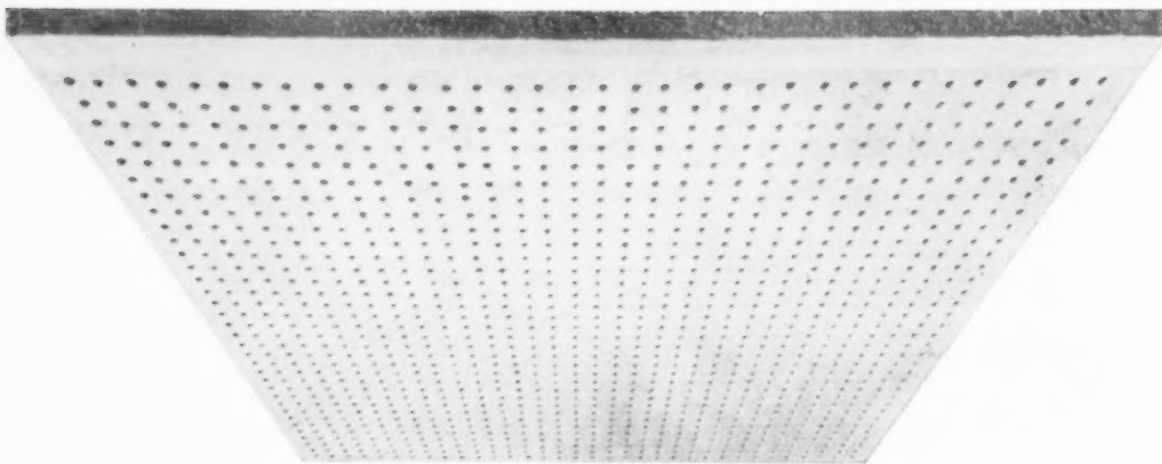
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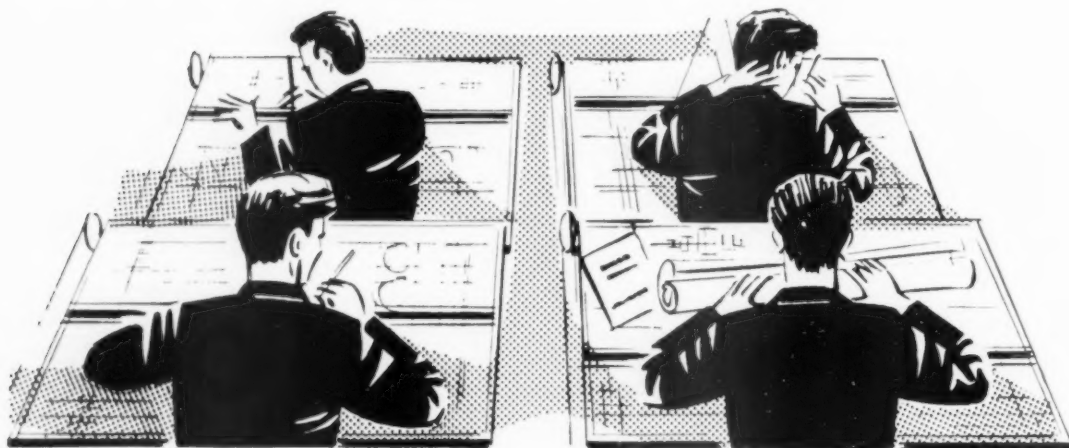
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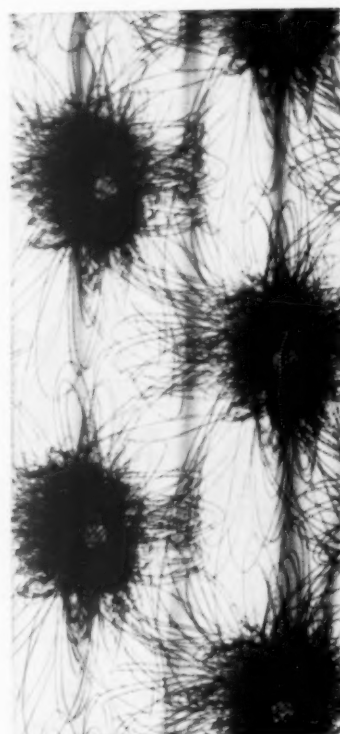
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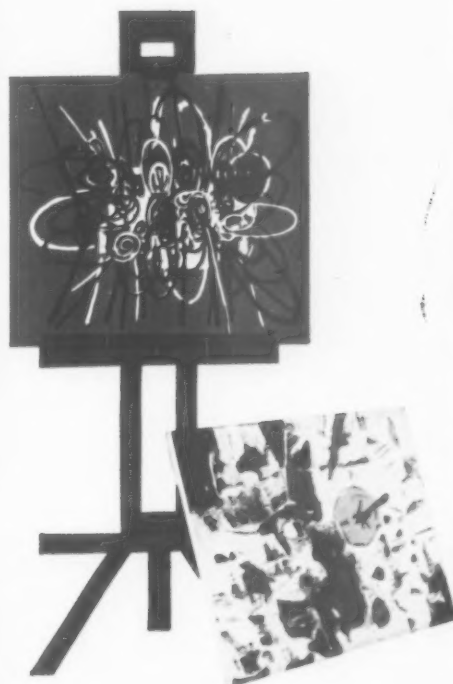
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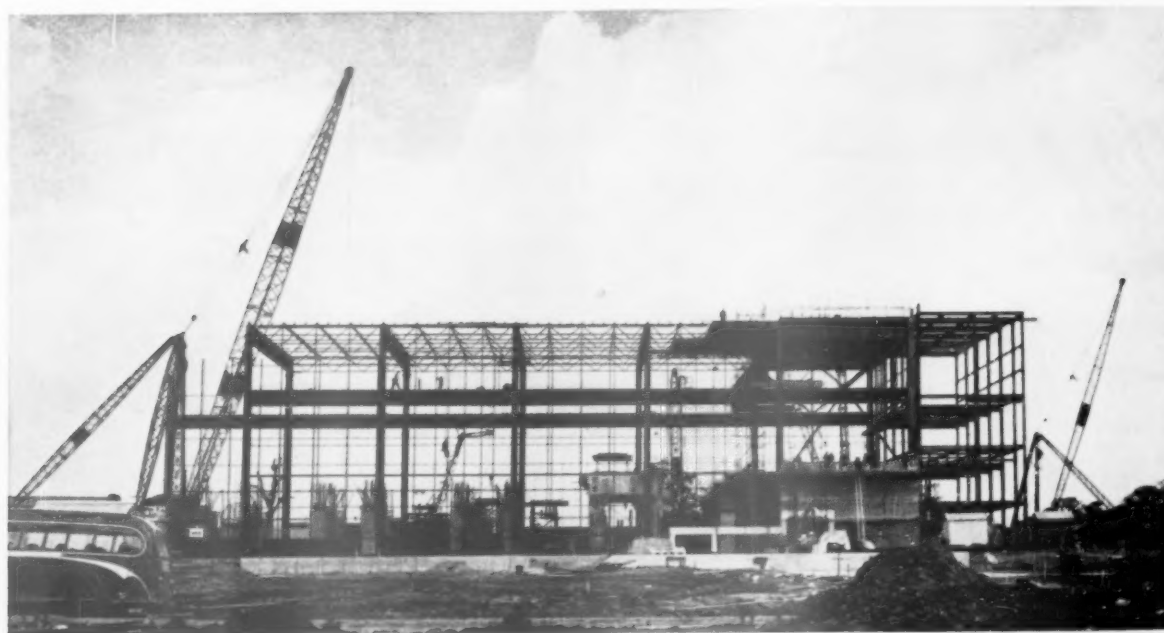
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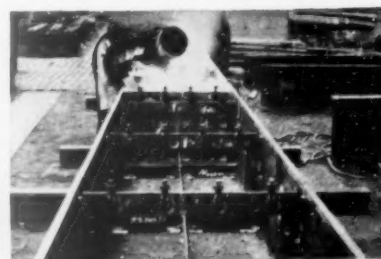


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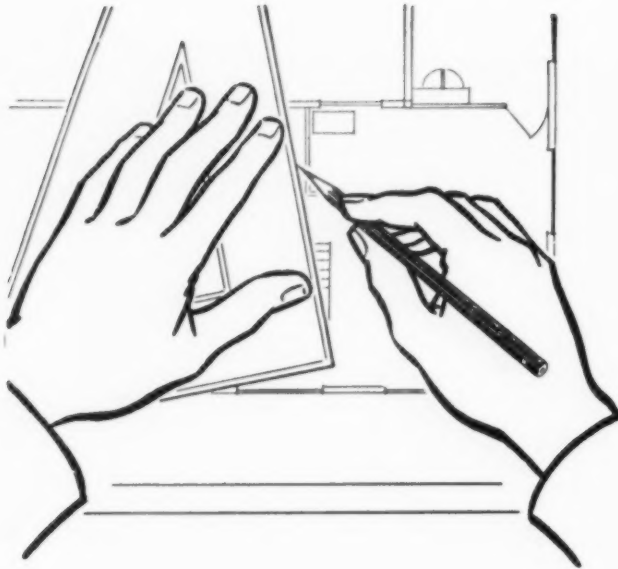
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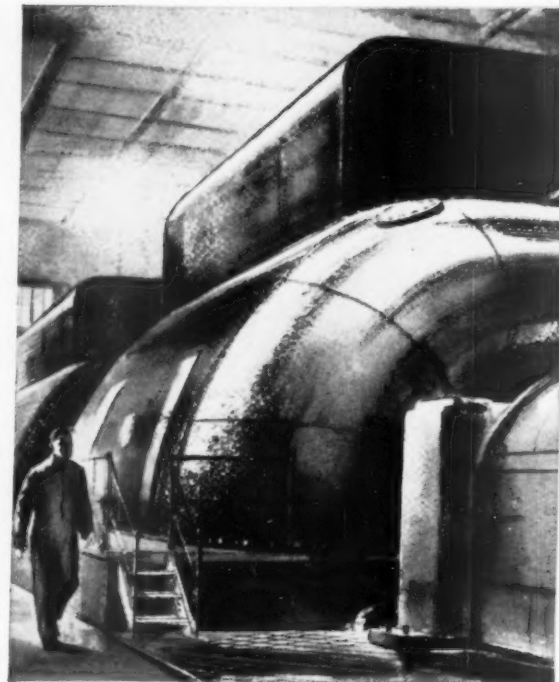
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The world's largest Generators will help to fill the demand for still more power

The development of nuclear energy for generating electricity is still front-page news. Less publicised, though no less outstanding, are new developments in "conventional" generating plant. The turbo-alternator shown here is a 550,000 kilowatt unit – twice the capacity of the next largest on order for the Central Electricity Generating Board. It has been designed for the projected new power station at Thorpe Marsh. For Blythe 'B', another new station, 275,000 kilowatt in-line units are on order. They will be powered by steam at 2,350 lb. per sq. in. and 1,050°F, with reheat to 1,000°F.

Nuclear power will play an important part in meeting the ever-increasing demand for electricity. Work is now in progress on the first three nuclear power stations, at Bradwell, Berkeley and Hinkley Point. By 1966/7 some 5 to 6

million kilowatts of nuclear-generated electric power will be available.

Though these projects will not be completed for some time, the Central Electricity Generating Board plays an important part in today's fight against inflation. Power stations are being built at a cost no greater than in 1948 – £50 per kilowatt installed. And, although the output of the industry has doubled since 1948, the increase in manpower is only about one-third.

By providing today for the power we shall need in years to come, the Central Electricity Generating Board is building a secure foundation for our future prosperity.

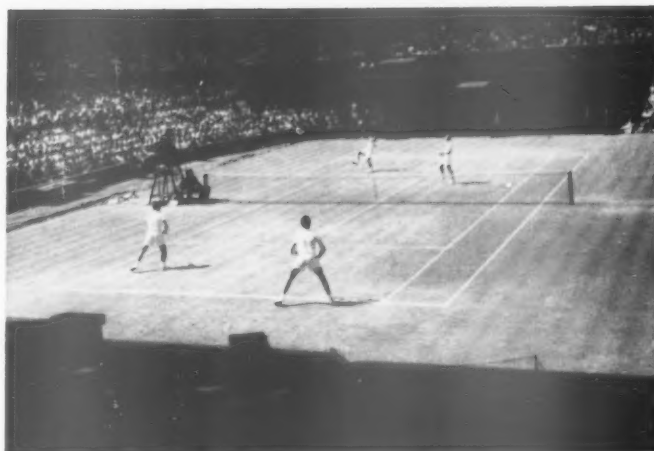


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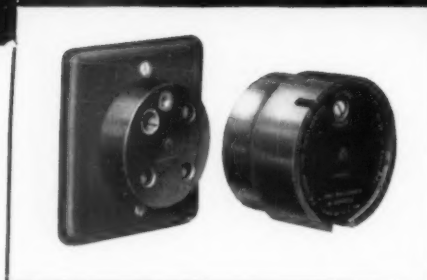
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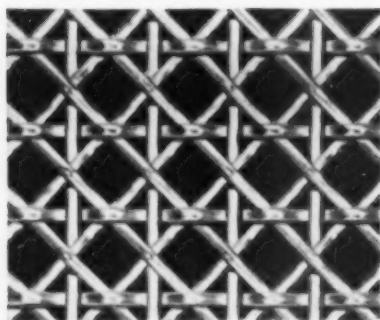
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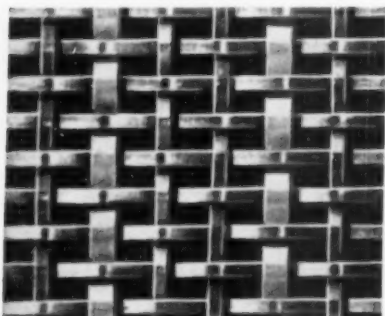
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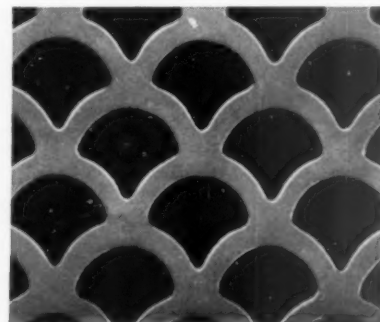
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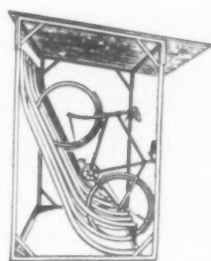


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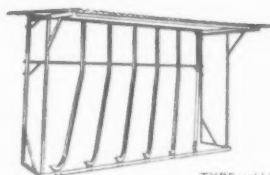
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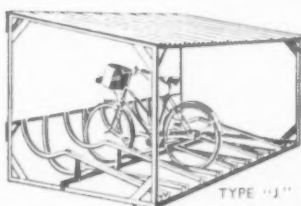
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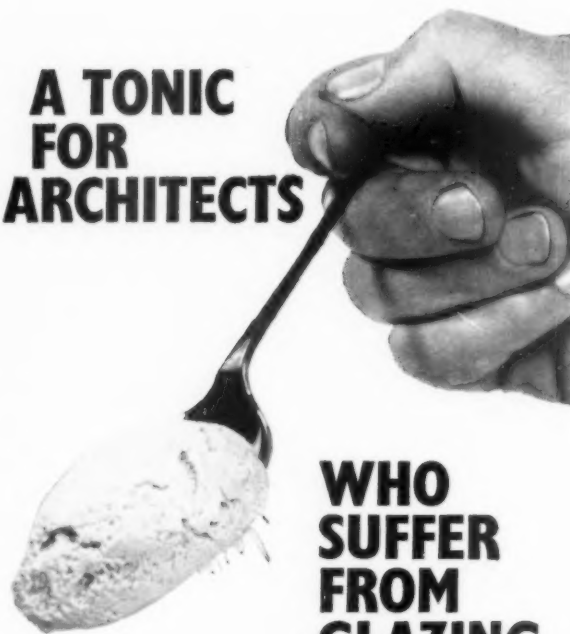
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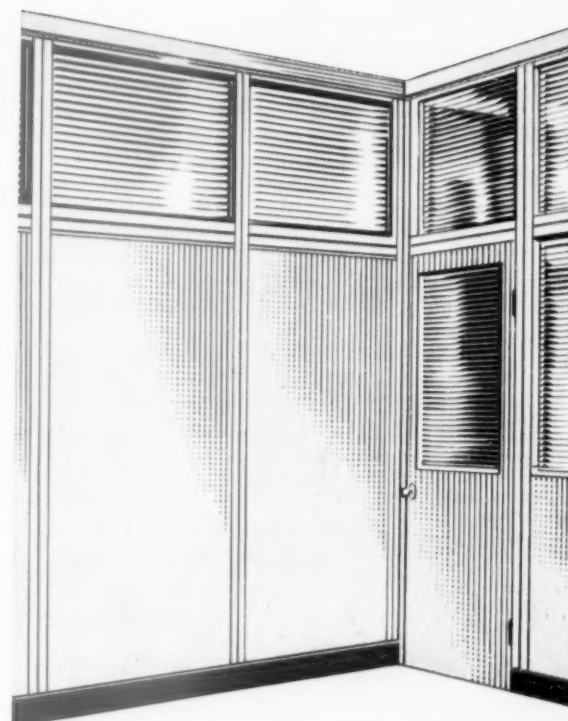
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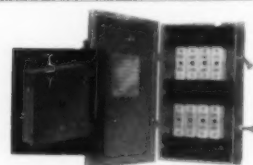
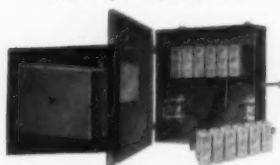
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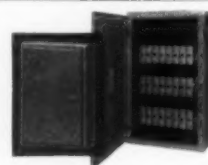
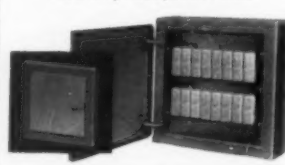
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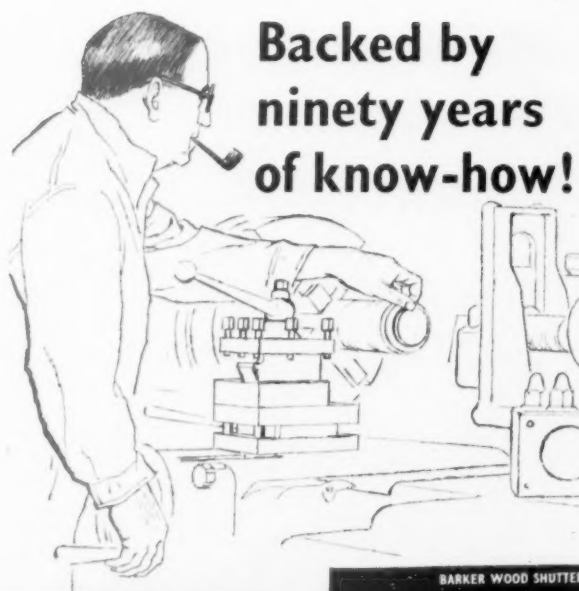
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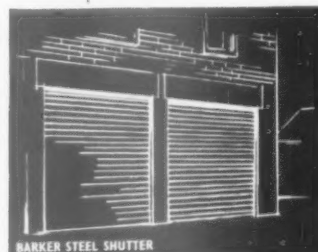


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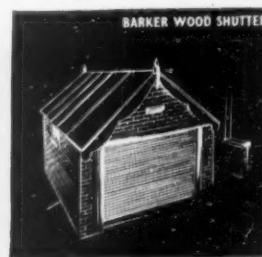
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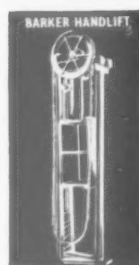
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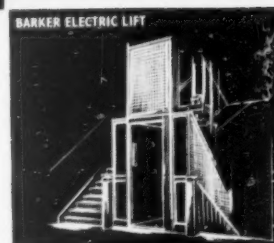
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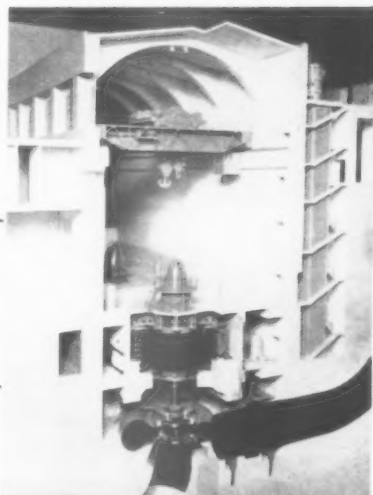
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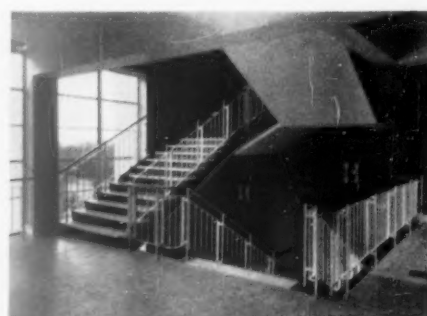
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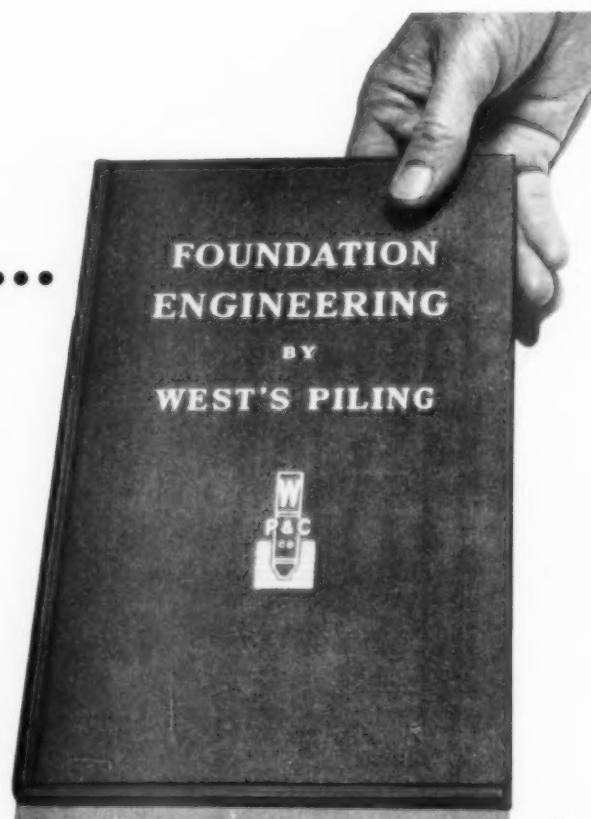
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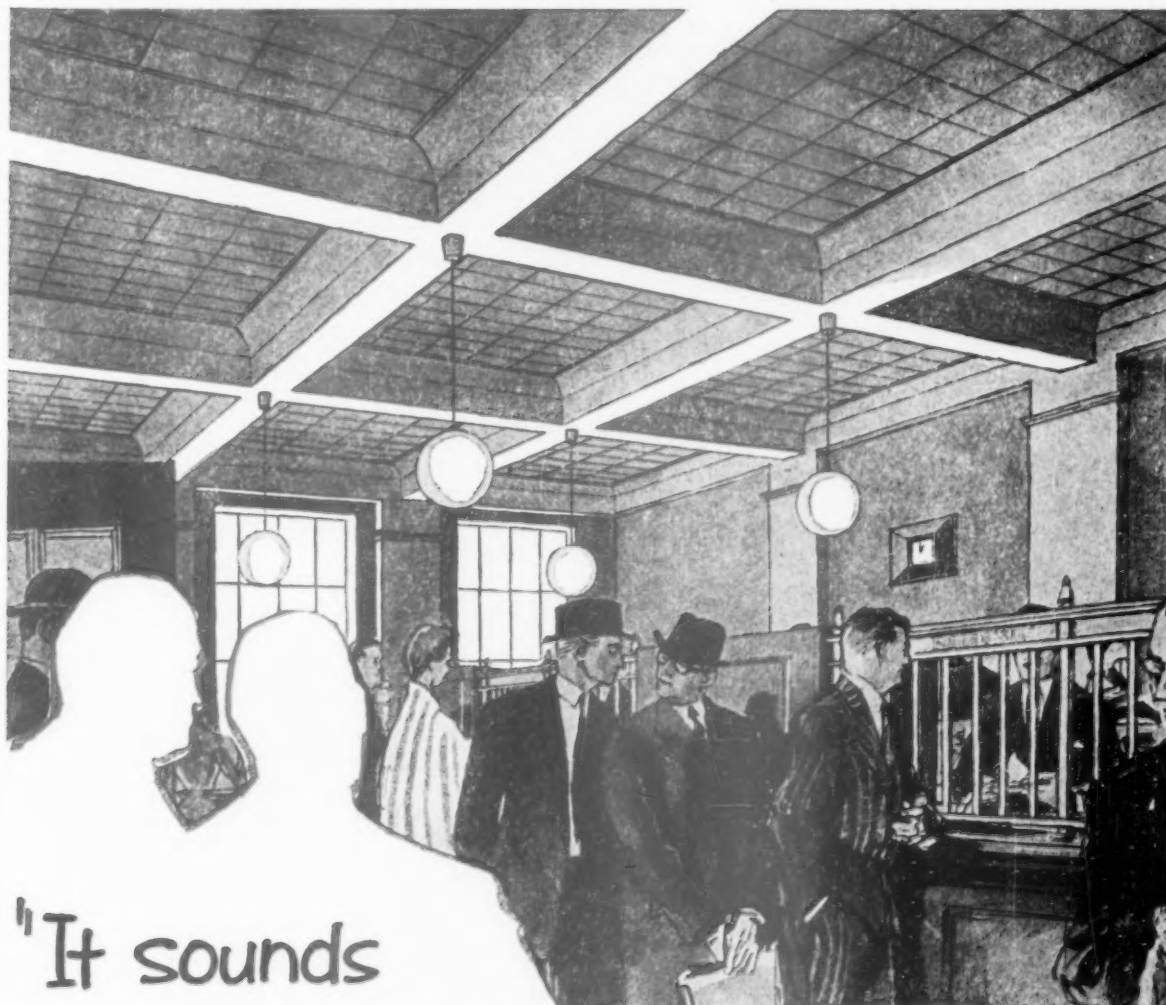
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